

# FARM CHEMICALS

April Volume 123 No. 4 50 Cents

Pioneer Journal of the Industry

APR 8, 1950

INSTITUTE OF AGRICULTURE

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36 HR FORECAST

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rainfall prospects  
reduce weather risks"**

Showmanship Sells  
Farm Chemicals  
Ounce for Ounce  
Uses "Wet Process"  
The Sugar Story

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## HIS BUSINESS IS MAKING YOUR BUSINESS BETTER

*Like all the men and women in Cyanamid's phosphate operation,  
his only business is phosphates for your mixed fertilizers.*

He's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into the kind of products and services you can use. Take advantage of both. Pick up your phone and call your Cyanamid representative.

### **The kinds of Cyanamid services you can use**

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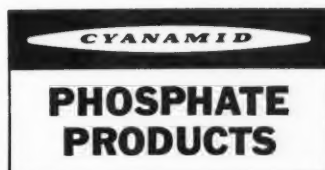
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**Products that serve:** Cyanamid's only phosphate business is mining and manufacturing the highest quality products for your mixed fertilizer requirements.

They are:

- Florida Natural Phosphate Rock
- TREBO-PHOS® — The Triple Superphosphate with controlled porosity
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*To manufacture fertilizers that sell... mix with Cyanamid's phosphates and service. American Cyanamid Company, Agricultural Division, New York 20, N. Y. \*TREBO-PHOS is American Cyanamid Company's trademark for its triple superphosphate.*



CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE



# Mixers! Look how U. S. Steepba

## U.S. FARM NEWS

a service of United States Steel producers of U.S. Ammonium Sulfate

### BIG YIELDS FORECAST FOR FARMERS WHO FERTILIZE NOW!

#### Farm Tips

##### Better Drainage

Recent growth of wheat and other crops in the Midwest has been a result of the heavy rains. But the heavy rains have also caused a great deal of damage to the crops.

##### Corn Planting

Planting corn in the Midwest is now well under way. The weather is just what the crops need.

##### Safety

It is a good idea to have a safety check on your tractor and other farm equipment before you use it.

##### Wetness

Wetness is a problem in the Midwest. It is a good idea to have a safety check on your tractor and other farm equipment before you use it.



Most agricultural experts agree that if all the factors that influence the quantity and quality of crops, the weather is the most often deficient. It is a certainty that insufficient drainage has proved to be the largest cause of low-quality crops and poor yields.

Experts measure water drainage from other crops. If it is a good idea to have a safety check on your tractor and other farm equipment before you use it.

Wetness is a big problem for farmers. It is a good idea to have a safety check on your tractor and other farm equipment before you use it.

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## U.S. FARM NEWS

a service of United States Steel producers of U.S. Ammonium Sulfate

### FALL FERTILIZATION CUTS SPRING WORK LOAD

#### FARM TIPS

##### Stretch water supply

Producers of grain and other crops will find it a good idea to have a safety check on your tractor and other farm equipment before you use it.

##### Use tractor wisely

It is a good idea to have a safety check on your tractor and other farm equipment before you use it.

##### Know your weeds

It is a good idea to have a safety check on your tractor and other farm equipment before you use it.

##### Buy buying saves time and labor

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##### Admon spring planting

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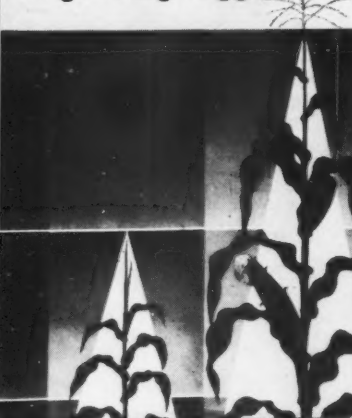
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### corn growing suggestions



### PROFITABLE CORN PRODUCTION DATA SHEET

Date \_\_\_\_\_  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
County \_\_\_\_\_

### Grass Forage Growing Suggestions

### 8 reasons why FALL FERTILIZATION PAYS

1. Fall fertilization cuts spring work load.

2. Fall fertilization cuts spring work load.

3. Fall fertilization cuts spring work load.

4. Fall fertilization cuts spring work load.

5. Fall fertilization cuts spring work load.

6. Fall fertilization cuts spring work load.

7. Fall fertilization cuts spring work load.

8. Fall fertilization cuts spring work load.

## U.S. FARM NEWS

a service of United States Steel producers of U.S. Ammonium Sulfate

### LOW-COST WHEAT YIELDS EXPECTED IN MIDWEST FROM FERTILIZER

#### Farm Tips:



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### Radio Program prepared and produced BATTEN, BARTON, DURSTINE & OSBORN

U.S. (00) AMMONIUM SULFATE

Spring Campaign

60-10-1

60-10-1

60-10-1

Farmers everywhere are searching for ways to increase yields.

One way is to use more nitrogen. Nitrogen is important in pro-

ducing more crops. As the production from each acre

is increased, it makes no difference what crops

are raised. Nitrogen is important in your fertility program.

Nitrogen, the U.S. Ammonium Sulfate — the free-living

nitrogen — is the best way to increase yields. Stop by

your local dealer.

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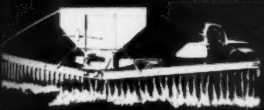


# backs your fertilizer sales

## steps to more FITABLE CORN



**test soil  
apply lime**



**plow down  
nitrogen**



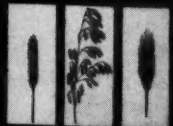
**use starter  
fertilizer**



**increase plant  
population**



**Small Grain Growing Suggestions**



Farm and dealer promotion by United States Steel backs your sales and helps you sell more fertilizer. Farm magazine ads. Local newspaper ads. Radio commercials. Direct mail. Literature. Movies. Posters. Signs. Samples. Books. Agronomic assistance on *your* promotion programs. U. S. Steel helps sell your customers on the importance of balanced fertilization and soil testing.

USS Ammonium Sulfate, during the spring rush planting season, can supply a good part of the nitrogen in those high nitrogen grades. USS Ammonium Sulfate will help you maintain production rates of mixed fertilizer to meet your customers' needs during this rush season.

**Place your order now for delivery when you need it. Better yet, be prepared for the big demand by specifying immediate shipment today. Contact your USS Ammonium Sulfate representative.**

*Sales offices located at: Pittsburgh, New York, Chicago, and Fairfield, Ala. USS is a registered trademark*



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#### MEMBER BUSINESS PUBLICATIONS AUDIT

The national business magazine for the fertilizer and pesticide industries, **FARM CHEMICALS**, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: \$6.00; in other countries: \$7.50. Current issue 50 cents. Back issues \$1.00. (Current issues become back copies on the 5th of the month following publication.) Established in 1894 as *The American Fertilizer*.

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# FARM CHEMICALS

Vol. 123 No. 4 April 1960

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## THE COVER PICTURE

What are the odds that, say an inch of rain will fall in Central Iowa next month? Just check the May Rainfall Prospects feature on page 19. You'll receive similar information each month to help you in your marketing activities. The odds are based on past rainfall weather records, going back 30 years. *Photo courtesy of U. S. Weather Bureau.*



# PRIMARY PRODUCERS OF FERTILIZER CHEMICALS

**COPPER  
SULFATE**

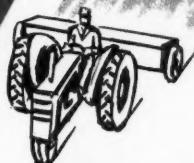
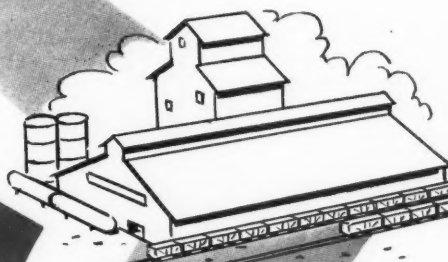
**MANGANESE  
SULFATE**

**ZINC  
SULFATE**

**IRON  
SULFATE**

**MANGANOUS  
OXIDE**

**MINERAL  
MIXTURES**



For more than thirty years we have manufactured highest quality nutritional trace elements for application in fertilizers and maintained a consistent program of research to further improve the quality and performance of these products—Our basic position and background in this field assures you of a plentiful supply of highest quality materials.

**Cut Costs** with combined carloads from one basic source.

**Cut Costs**, save time, plant space and effort by using our custom formulated mineral mixture service—We will supply combinations of minerals mixed to your particular specifications.

**Our Products** are backed with service, research and technical assistance.

**Foliar Nutritional Products Include**—Iron, Zinc and Manganese Compounds—**NU-IRON, NU-Z, NU-MANESE and ES-MIN-EL** a foliar applied mineral mixture.

For samples or literature, make request on your firm's letterhead.



**TENNESSEE CORPORATION**

612-29 Grant Building

Atlanta 3, Georgia





# WHAT'S DOING IN THE INDUSTRY

F  
C

## **HOOKEER BUILDS ANOTHER PHOS. FURNACE IN TENN.**

Hooker Chemical Corp.'s board of directors has approved an appropriation of \$6,373,000 for construction of a third phosphorus furnace to reduce phosphate rock at the Columbia, Tenn., plant of the company's Phosphorus Div. The expenditure will also cover addition of one extra large kiln and revamping and improvement of the entire materials handling system.

Construction is expected to be completed during the third quarter of 1961. The furnace will add 20,000 tons per year of elemental phosphorus to Hooker's present capacity of 45,000 tons per year at Columbia and 6,000 tons per year at Niagara Falls.

## **NAC MEETING DATES**

Lea S. Hitchner, executive secretary, reports that the National Agricultural Chemicals Association's annual meeting will be held September 27-29 at the Hotel del Coronado, Coronado, Calif.

Reservations should be made directly with the hotel.

## **ESCAMBIA APPOINTMENT**

James A. Hunter has been named product sales manager—agricultural chemicals for Escambia Chemical Corp. He goes to Escambia

from Texas Gulf Sulphur Co., where he was a member of the sales department.

In his new capacity, Hunter will be responsible for the sale of Escambia's nitrogen products, and will work with Ashcraft-Wilkinson Co., exclusive sales agents for Escambia's nitrogen products.

## **CHEMICO BUILDS NITRIC ACID PLANT IN RECORD TIME**

A \$1¼ million nitric acid plant with rated capacity of 120 tons per day has just been completed and placed on stream at Lawrence, Kan., six months after the day the contract was awarded. Chemical Construction Corp., New York, engineered and constructed the plant for Cooperative Farm Chemicals Assn.

Nitric acid produced will be used to make ammonium nitrate fertilizer.

## **VELSICOL APPOINTMENTS**

John F. Kirk, vice president since 1954 and a member of the board of directors since 1958, has been named executive vice president. Bernard H. Lorant becomes vice president in charge of research and a member of the board of directors. A. B. Chadwick has been named vice president in charge of manufacturing and engineering.

## **RESULTS OF BLAST AT DIAMOND'S NEWARK PLANT**

Investigation is continuing into the February 20 blast at Diamond Alkali Co.'s Newark, N. J. plant. The pressure surge which tore apart the building killed one man and injured 10 others.

Investigations to date indicate that a chemical reaction went out of control and that a nozzle was torn from the reaction vessel. The vessel was recently tested in accordance with standard safety practices, Diamond said, and the safety devices on the vessel functioned properly.

The blast occurred at 11:58 a.m., just as a skeleton crew of 25 men was going to lunch. It blew the roof off the three-story building and filled the streets surrounding the plant with rubble. Fatally injured was Anthony G. Casatelli of 29 Bruno St., Moonachie, a chemical engineer.

Facilities for formulating the two major herbicides are back in full operation in the plant building across from the damaged structure.

All but one of the injured—John Burton, plant manager—have been released from the hospitals. Burton is reported to be recovering nicely.

## **C. F. BURROUGHS DIES**

Charles Franklin Burroughs, chairman of the board of F. S. Royster Guano Co., died on Wednesday, Feb. 24.

## **STEPAN CHEMICAL BUYS IOWA FERTILIZER FIRM**

Expansion into the liquid fertilizer business through acquisition of Ris-Van, Inc., of Belmond, Iowa, was announced recently by Alfred C. Stepan, Jr., president of Stepan Chemical Co.

Ris-Van was purchased through an exchange of stock. Stepan traded 21,800 shares for the firm. Sales of Ris-Van amounted to \$2.3 million last year, and are expected to rise to about \$3.5 million this year.

Ris-Van will be operated as a wholly-owned subsidiary under present management. Kenneth Van Duzer continues as president.

## **Meeting Highlights**

### **THIS MONTH:**

#### **Eighth Annual California Fertilizer Conference**

*McLane Hall, Fresno State College, Fresno, Calif.*

**April 11.** An outline of the geology and manufacture of phosphate fertilizer materials will be given. Robert Z. Rollins, chief, California Bureau of Chemistry, Sacramento, will discuss industry problems as seen by his office. New phosphate fertilization information will be presented.

During the afternoon, a field tour of fertilizer plots and demonstrations in the vicinity of the campus is scheduled.

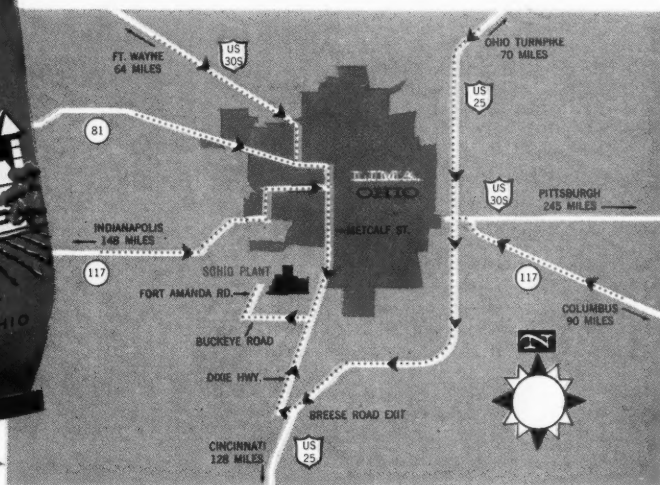
In the evening, the annual banquet will be held at the Fresno Hacienda Hotel. Earl Coke, vice president, Bank of America, San Francisco, has been invited to speak on the topic "A Banker Looks at Fertilization for Enhanced Loan Security."

**April 12.** A panel will discuss "Legume-Fertilization", followed by general audience discussion.

The conference is sponsored by the Soil Improvement Committee of the California Fertilizer Association. J. H. Nelson, Nelson Laboratories, and Earl R. Mog, Growers Fertilizer Co., are directing the program subcommittee.



**SOHIGRO UREA**  
 rounds out your line  
 ... and we map  
 the way to do it!



Lima is the hub of Ohio's major highways and 5 leading rail lines — a big advantage when you want Sohigro Urea fast — via direct delivery or plant pickup.



Handy! That's the Sohio plant at Lima, Ohio. It's your convenient source of Sohigro Urea to make your fertilizer line really complete this year. Handy for us to serve you by rail or truck ... also your easy-to-reach location for plant pickup.

**Fact, not fad!** That's the story on supplementary nitrogen. There's a big and booming demand for extra nitrogen over and above what even high-nitrogen mixed fertilizers can furnish.

**Extra dollar volume!** It's yours ... the easy way ... with Sohigro Urea. Built-in farmer acceptance. Solid sales features: Prilled, free-flowing, easy to apply. Delivers 45% actual nitrogen ... more than any other solid nitrogen fertilizer. Fast-acting, but long-lasting.

Fill out your fertilizer line for 1960 with Sohigro Urea. Use the map to route your trucks into Lima. Write for extra maps to supply each of your customers with the right route. And ask your "Man from Sohio" about the extra profits you can make by adding Sohigro Urea to your fertilizer materials.

See Sohio first for high-quality 45% or uncoated 46% urea — anhydrous ammonia — aqua ammonia — 18 nitrogen solutions, including all urea types.

... we're serious about **SERVICE** at Sohio

**SOHIO CHEMICAL COMPANY**

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8-60

# LETTERS

**F  
C**

## HOW TO "CURB FLEMMING"

Portland, Oregon

May we congratulate you on your very fine, up-to-the-minute report, Washington Viewpoint February 1960 page 10.

We note with interest that eleven major farm organizations have united in a campaign to "Curb Flemming". May we offer, as gained from past experience in Washington, that the "Achilles heel" to "curb Flemming" is for these farm organizations to exert all possible pressure on their respective members of Congress to "curb" and defeat all possible appropriations for Flemming's extended activities covering agricultural food crops for man or animals.

Adequate regulations and safeguards to public health on agricultural chemicals used on food crops have been handled efficiently and effectively by the United States Department of Agriculture for many years, working in cooperation with Industry and Food and Drug.

Flemming's attempt to usurp this power of decision from the USDA can be checkmated only if his extended applied for appropriations are denied him. The \$3 million suggested appropriation should be entirely deleted. Congress can do this.

The picking of a few isolated cases of misuse of agricultural chemicals and a broad timely publicity program to create a "cancer scare" in the minds of the public are but a means to the end of securing increased appropriations and legislation to take over the entire field of food crop supervision from the USDA.

No farm organization should allow this to happen. The broad terminology of the Delaney amendment (Food Additive Act) should be corrected so that the USDA maintains their position as in the past.

Very truly yours,

ROY E. MILLER  
President

MILLER PRODUCTS CO.

## MARKETING EMPHASIS "A MAJOR CONTRIBUTION"

Chicago, Ill.

I was pleased to hear that you will have all the reprints available except one that I requested...

Your emphasis on merchandising and marketing programs in my opinion, is certainly making a major contribution to the Industry. I would like to commend you and all the Staff of FARM CHEMICALS for the excellent job you are doing. We find that many of your articles are invaluable in our dealer training programs...

Sincerely,

LEO ORTH  
Agronomist  
SINCLAIR PETROCHEMICALS,  
INC.

Midland, Michigan

Mr. Otis, manager of our Agricultural Chemical Sales Department, thanks you for sending him the December issue of

FARM CHEMICALS as requested.

It is necessary for his department to obtain reprints of articles on pages 18, 22, 26 and 30 in the February volume 123 number 2 of FARM CHEMICALS. If twenty-five reprints are not available, we will have to purchase twenty-five copies of this issue...

Very truly yours,  
CAROLE HEIDERER  
DOW CHEMICAL  
INTERNATIONAL  
LIMITED S.A.

## "SUCCESSFUL SELLING"

Texarkana, Tex.

In February, Volume 123, No. 2, on page 22, we note that this is the tenth in FARM CHEMICALS "Successful Selling" (series).

We would like very much to have a copy of each magazine which includes these or a copy of each. Would appreciate getting these if available, and you may bill us for expense.

Thanking you, we are

Yours very truly,  
HAROLD TRAMMELL  
President  
FARMERS FERTILIZER CO.

Paris, France

We have read the periodical FARM CHEMICALS of July, 59, in which there is some information on a report of the U. S. herbicide market by Doane Agricultural Service, Inc.

We would like to know where, and if possible, for what price we could obtain the 1959 report...

Very truly yours,  
F.E.C.I.C.

Los Angeles, Calif.

Enclosed is 50 cents in coin to cover the cost of the following publication as listed in the December 1959 issue of the Distribution Data Guide: "How to Figure Sales Potential"...

Yours very truly,  
STANLEY BIEHN  
Manager Marketing Research  
UNION OIL CO. OF CALIFORNIA

Minneapolis, Minn.

Thank you very much for forwarding the inquiries which you received in response to your "Readers' Service" item about "Non-Toxic and Low Residue Agricultural Insecticide Concentrates."

We will follow up by writing the folks who have sent in their inquiries.

The number of replies not only attests to the wide readership of your magazine but we believe also indicates a resurgence of interest in the idea of nontoxic insecticide materials. This is quite natural under the present confused conditions.

Yours very truly,  
PAUL D. TORPIN  
Vice President in charge of Sales  
McLAUGHLIN GORMLEY  
KING CO.

Painesville, Ohio

This is just a note to express to you both personally and on behalf of the Northeastern Weed Control Conference our very great appreciation for your helpful contributions to the activities of the Public Relations Committee. I certainly feel that you and other members of the Committee through your interest and efforts were most successful in giving our conference the type of coverage which is necessary and desirable. I also feel that through the recorded tapes and other media many of the things which developed at the time may continue to be used information-wise and keep the conference in the public view. I am sure that we can be quite proud of the success of the conference through the cooperative efforts of the various people involved such as yourself.

Again with sincere thanks and best regards, I am

Sincerely yours,  
L. GORDON UTTER  
DIAMOND ALKALI CO.

## EXPENSE VS. INVESTMENT

Emporia, Kansas

This is my reaction on Market Analysis Investment or Expense. (March issue)

Well, I can see that we are back at it again. You know a marketing man hates to be considered as an expense. He likes to think of himself as creative, useful, and sometimes even brilliant. Frankly, of course, he is an expense. But then, just as every sales is also a purchase, every expense is an investment, or vice versa.

It would be an extremely tricky thing to try to set up market analysis results as an investment. First of all, as in the case of the Edsel, they might be all wrong. Secondly, they might be excellent, but someone else might nullify them with a better job. Thirdly, when they are right, why not write them off as expenses and have a nice fat budget for next year. I think you might get a better tax break this way.

As for the long-range effect, I don't see that a long-range budget would help a marketing division by being called an investment. True, it saves our ego, but otherwise what difference would it really make. If a firm calls in a marketing man, it is usually because it has a problem. It wants an answer and it doesn't much give a whoop what it calls that answer as long as the answer is right. Anyway, you must admit that a wrong answer looks even worse called an investment.

F. E. HARTZLER  
Small Business  
Management  
KANSAS STATE  
TEACHERS COLLEGE

Lawrenceville, Ill.

We have been receiving FARM CHEMICALS for the past six months and think it is a very informative publication...

Very truly yours,  
GEORGE E. ENGEL  
Plant Food Supervisor  
RICH-LAW SERVICE CO.

FARM CHEMICALS



US Pp

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## U.S. PHOSPHORIC PRODUCTS

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# WASHINGTON VIEWPOINT

F  
C

- ▶ *Inflationary trends slow down; interest rates to ease off in months ahead.*
- ▶ *Poll shows 80% of farmers favor continuation of ACP at current rate.*
- ▶ *Higher minimum wage now seems certain of congressional approval.*

**Money tightness loosens.** Federal monetary experts now are talking of the surprising fluidity showing up in the money markets. Not a marked loosening, but enough to indicate that it is more than just a passing phase. A "temporary" easing in the past few months now is looked upon as a more or less permanent thing expected to continue through most of the year. It means that inflationary trends are slowing down considerably. While a further "inching" up in the general level of prices is likely, inflation for all intents and purposes has been licked for the time being. This is the general view of the federal money men. This also means that industry is likely to find lenders more interested in lending—and that those who buy from the chemical industry can more readily under-write purchases through loans. The current subtle change thus is important for both expansion and sales.

**Interest rates** are expected to show a noticeable easing off in the months ahead. If you're thinking about borrowing—either for business or for personal purposes—consider a short waiting game for the cost of money is going down enough to make a wait profitable.

**Politics and pigs.** Republican chances for making a come-back this fall in the Midwest are likely to receive a stiff shot in the arm from an unexpected quarter: Hogs. The Agriculture Department's latest survey of farm farrowing intentions this spring indicates that prices this summer and fall will be at least \$4 per hundredweight higher than a year ago.

The spring pig crop is expected to be down 12-13% from the 1959 crop, pointing to a 20-25% increase in price. This is the crop that will be marketed as hogs in the summer and early fall months.

**Republicans get joy** from contemplating this bonanza from the farm belt axiom that when hog prices are high, farmers vote their contentment for the party in power. Conversely, if hog prices were to stay low or go down next fall, Republicans would be hard put to make a come-back in the Midwest.

**Democrats** have increased their congressional seats from the traditionally Republican Midwest in each of the past three elections. But with high hog prices, many farmers are likely to forget some of their animosity to the Benson farm policies and return to the GOP fold.

**Farm acreage in 1960** will continue at last year's levels, according to the Agriculture Department's March planting intentions survey. Total acreage

farmers plan to seed this year is 337 million—less than 1 million below last year's acreage when a record-matching production was produced.

**Fertilizer and chemical sales** to farmers should continue at a higher rate, as a result. Furthermore, farm receipts from field crops in 1959 were at a record \$14½ billion—pointing to the fact that many farmers may not be as bad off financially as many reports indicate. Last year's income decline for agriculture as a whole came entirely in livestock.

**Corn acreage** will increase from 85 million to 86 million acres between 1959 and 1960. While the acreage increase is moderate, the real story on farmers plans this year comes from another side. That is, farmers intend to plant more seeds per acre than ever before—according to increased purchases of hybrid seed. A record crop of at least 4½ billion bushels now is possible—provided growing weather cooperates.

**Soybean acreage** is increasing 1½ million acres this year, to a level of 24½ million. Potato acreage will be up 1½%, sugar beets, 4%; continue is likely to be up 6-8% (although there's no official estimate until this summer.) Most other crops are expected to continue at about last year's levels, with sizable decreases likely only in oats, down 8%, and barley, down 4%.

Soil moisture conditions are reported from adequate to excellent over most of the farm country—due to the heavy general snow falls of late February and March. Thus, farmers find themselves over the first hurdle to a successful production season. On the other hand, late snows and excessive moisture has delayed entrance to fields in some major areas—thus pointing to a late spring work-load clearance.

**More trouble ahead** for the Conservation Reserve because of the planting intentions report. Conservation Reserve officials had reported that land retired into the CR would increase by about 5 million acres this year. On the other hand, farmers plan to cut cropped acreage by less than 1 million. This has raised congressional eye-brows in view of the evidence that the expensive CR now only is retiring land that was largely idle in the first place. No good words have been spoken in behalf of the CR in Congress since it convened in January. Biggest boost for continuing the program (which expires this year unless extended) came from President Eisenhower who recommended it be extended and increased from this year's 28 million acres to 60 million.

(Continued on page 12)



## 38 plants...for prompt delivery of AA quality products

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Bone Products • Fluosilicates • Ammonium Carbonate  
Sulphuric Acid • Phosphoric Acid and Phosphates  
Phosphorus and Compounds of Phosphorus





# What's Coming Next Month

As we write this, farmers are gambling against the odds. In too many cases, the cards are stacked against them.

"When will the best balance occur between enough rain to germinate seed and too much rain that will either drown the crop or bring on seedling diseases?" they're asking themselves.

You may ask: "Isn't FARM CHEMICALS a month or so late with rainfall information?" Answer: *If so, better late than never! However, if anyone gives this service a moment's thought he'll see that . . .*

## ■ NEXT MONTH'S RAINFALL

prospects could have a terrific influence on pesticide shipments—as well as a number of other marketing activities. How you use this information is up to you. Don't forget to write us, however, and tell us how we can improve the service, *as well as how you are now using it.*

In our study of the weather, we've heard of some other intriguing work in *figuring the odds*, which leads us to another interesting feature for next month . . .

## ■ PREDICTING PLANT DISEASE

County agents and specialists are ingenious fellows. In New Jersey, for instance, a county agent and an extension specialist cooperated with a USDA pathologist in a successful reduction of downy mildew disease of lima beans in one of their counties. Their methods have provided local growers the confidence needed that the disease need no longer wipe out their profits. The story of how they prescribed *when* and *how* to apply fungicides will appear next month.

## ■ THE CREDIT MESS

"It is generally conceded that the financing of fertilizers and pesticides is in a mess," reports one of the authorities from whom FC gathered material for this special report. Who's to blame? What's the answer? Some suggestions will appear in this article which "pulls no punches."

**. . . in the new**

# FARM CHEMICALS

EPA

## WASHINGTON VIEWPOINT

**Farmers favor ACP.** A new survey by the National Limestone Institute shows that 80% of the farmers polled favor continuation of the Agricultural Conservation Program at the current rate. ACP should not be confused with the Conservation Reserve Program. Under the former, USDA pays 50% of the cost of installing conservation practices on farms. Under the latter, farmers retire land for periods ranging from 3-10 years with gov't paying land rent plus a share of the cost of the first year's conservation practice installation. They are separate programs.

**The President recommended** that the ACP fund be cut from the usual \$250 million in payments to \$100 million—which would exclude payments for liming and fertilizer practices. NLI reports that 60% of those surveyed—and it polled 70,000 farmers—believe that the payments should be boosted to the full \$500 million authorized by law but never appropriated.

As an added touch, NLI limited the survey to 18 states represented by 26 senators who voted to cut ACP funds last year.

**Fertilizer sales tip:** The price-cost squeeze shows signs of letting up for the first time in about 5 years. Since 1955, farm income not only was eroded by the inflationary spiral but by a continuing slide of farm prices produced to a large extent by annual reductions in price supports. This year will see the bottom of the price support reductions for at least a year—due to change of government administration. For at least the next two crop seasons, farmers can count on stable prices for things they sell relative to other recent years.

It means that any increase in production volume—particularly next year—offers farmers a greater opportunity for higher returns. That is, they won't have to allow for reduced crop prices as they had to in most years since 1955.

**Higher minimum wage** now seems certain of congressional approval. Current legal minimum for millions of workers is \$1 an hour. Outlook at this point is that this will be boosted to \$1.10 or \$1.15 an hour. That's as much as the President is expected to accept—although Democrats are pushing for a hike to \$1.25 in this election year.

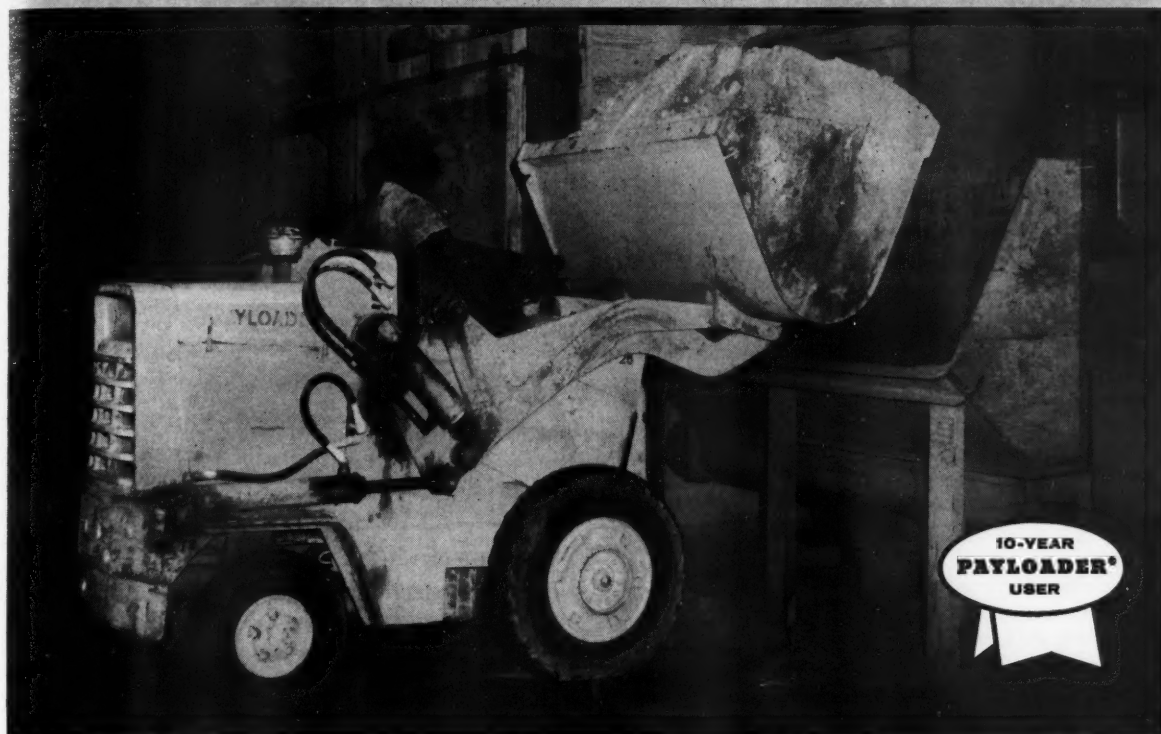
Even if your workers are not covered, your company is likely to feel the effects of a higher legal minimum. Experience with the wage law shows that the general level of wages is pulled along up with the legal minimum.

**Crash research program proposed.** In a surprise move the other day, the American Meat Institute—representing mostly big meat packers—called on Congress to launch an intensive research program to develop new chemicals and biological methods to eliminate dangers of food contamination.

The AMI urged that Congress increase by 8 to 10 times the Administration's request of \$1½ million for this type of research.

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# Demonstrate with SHOWMANSHIP

*In this twelfth in FARM CHEMICALS' series of articles on "Successful Selling," the author offers tips on how to sell the senses with a touch of P. T. Barnum*

SOME years ago, a damaging rumor threatened the existence of the *Philadelphia Evening Bulletin*. The newspaper, it was whispered, was going downhill: readers were deserting the *Bulletin* because it carried too much advertising, not enough news.

Even as advertisers began to talk about cancellations, the editorial board of the newspaper called an emergency meeting. Something had to be done—quickly. But what?

The answer came in an inspired flash of insight.

The *Bulletin* excerpted all the reading matter from one of its regular editions—exclusive of advertisements—and published it as a 300-page book called *One Day*. Copies of the volume were sent to advertisers.

Black on white and between hard covers, the *Bulletin* proved its point beyond a shadow of a doubt—it offered its readers *daily* as much news and features as would occupy the pages of a book costing several dollars. And it sold all this for just two cents.

The rumor died in its tracks.

Why? Because the *Bulletin* knew that the swiftest way to get its message across was to—dramatize it. It could have issued vehement denials or cited impressive figures, but words and numbers can be distrusted and dismissed. On the other hand, "Seeing is believing."

The moral for the salesman: the more dramatic you make a demonstration, the more convincing your sales message becomes. What a prospect sees with his own eyes or feels with his own hands he must believe in his own brain.

### THE PURPOSE OF A DEMONSTRATION

Most people are naturally skeptical. They have a built-in "disbeliever" that automatically discounts the value or importance of anything novel.

As a salesman, you are frequently the bearer of precisely what they are conditioned to resist—news.

Demonstration helps you resolve this "conflict of interests"—in your favor. It enables you to prove that what you claim for your product or service is true. It makes the benefits you have to offer vivid so that the desire to own them is heightened. It whets the customer's appetite. It lights a bonfire under him. It spurs him into action.

It *should* do all this. Often, it doesn't.

But it can—if it's given a dramatic shot in the arm.

Every demonstration is an approach to showman-

By TED POLLOCK

ship. However, you can demonstrate your product prosaically (and hope that your prospect has an active imagination) or use reasonable theatricals to get your message across with maximum impact.

At your disposal are five eager allies—your prospect's eyes, ears, hands, nose and tongue. For, without exception, effective demonstrations sell the senses as well as the mind.

### MAKE HIM SEE IT

Everybody enjoys a show. We like to see things moving, happening, in action. Indeed, psychologists have found that over 85% of *all* the things we ever learn are learned through the eyes.

The salesman who trains himself to think in terms of "What can I *show* my prospect that will jolt his interest?" is well on his way toward eliminating one of his greatest enemies—customer inertia.

Consider the young engaged couple who visited a china shop. The groom-to-be had never before had any interest in china. He wandered non-committally about the store, looking "but seeing not." His fiancée obviously knew a great deal more about such things, but the salesman correctly assumed that since the man would be paying, he needed some assurances about the quality of the product.

The salesman decided on a simple demonstration. He took a cup from an expensive set of Wedgwood bone china, placed it on the floor and *stood* on it. The fragile-looking cup supported his full weight. He picked up the cup and handed it to the young man without a word. This visual proof of bone china's strength struck home. The sale was made.

That salesman knew his wares and how to prove superior quality to a prospect who knew very little about the product. His dramatic demonstration seized the young man's imagination and kindled interest where it didn't exist before.

How? Through the eyes.

Roy Halvorson, the "Christmas Tree King," has to convince potential customers that his table-top processed spruces are superior to the competition's.

Like other table-top tree marketers, Halvorson fits each into a base containing nutrients so that it lives



well past the holiday season in a heated apartment. Unlike competitors, though, he fits a cellulose sleeve around the trunk before inserting it into the metal stand. Others dowel the trunk and fit it into the stand.

Halvorson's job: to prove that the outer layers of the trunk—which he does not sacrifice—are the important “feeding” layers for the passage of nutrients throughout the tree. To do this, he inserts a base in a harmless ink solution. The tree trunk's outer layers color from the ink, proving that they do the feeding.

“People can't pooh-pooh what they see with their own eyes,” says Halvorson.

In solid agreement is the Johns-Manville salesman who waited for the first snowstorm of the year before re-visiting a particularly obstinate prospect.

He wasted no words as the man opened the door.

“I'm from the Johns-Manville Company. Come out and look at your roof. There's no snow on it.”

Grumbling, the prospect took a look. “Okay,” he said, “there's no snow on it. So what?”

“Just this,” answered the salesman. “Look at your neighbors' roofs. Covered with snow. They aren't paying heating bills to melt snow on the roof. Your heating bills must be about 15% higher than theirs.”

This was the kind of demonstration the prospect could understand. He invited the salesman in. The salesman showed him how Rock Wool insulation would save him money on his heating—and the sale was made.

#### **TRANSLATING “INVISIBLE” BENEFITS**

Visual demonstrations need not be confined to tangibles, either. Frequently, all it takes is a little thought to translate an “invisible” benefit into an eye-opening selling point.

A representative for a mutual fund, for example, shows a prospect two equally shiny, apparently identical quarters.

“Can you tell the difference between these coins?” he asks. When the prospect finishes examining them and confesses that he can't, the salesman points out that one was minted in 1949, the other in 1959.

“This quarter,” he says, pointing to the first, “bought 25 cigarettes on the day it was coined. The 1959 quarter bought 17 cigarettes when it was born. At that rate, do you know how many cigarettes a 1969 25-cent piece will buy? Less than 12! And what's been happening to quarters and cigarettes has been happening to dollars and rent, dollars and food, dollars and clothing.”

By thus dramatizing the problem of the shrinking dollar, the salesman rivets the prospect's attention on what he has to sell—an investment plan to protect him against the ravages of inflation.

#### **MINIATURIZATION, OTHER AIDS**

Many salesmen sell products that are not portable—large machinery, boilers, furnaces, diesel engines and so on. Their solution: miniaturization. A compact, working model of what you sell not only hammers home your point; it has a novelty appeal that helps you and your product be remembered.

When miniaturization is not feasible, more than one company has found that photographs, film strips, slides or blueprints of their products can be almost as effective.

#### **MAKE HIM HEAR IT**

Only in a few fields is the customer's sense of hearing appealed to regularly. The man who is considering buying a house is encouraged to rap the walls for aural proof of sound construction. Crystal is tinkled reverently in the chicquer department stores. “Listen to that motor purr,” say automobile salesmen. Radios and television sets are turned on for the prospect's appreciation. A few more examples round out the “regulars.”

Yet, the surface has barely been scratched.

And precisely because the sense of hearing is neglected in most demonstrations, it represents almost virgin territory for the alert salesman.

A salesman for a lubricant manufacturer, for example, always carries a stethoscope along with samples of his product. Comes demonstration time, he invites prospects to *listen* to the quiet operation of his product in action.

The New York representative for a sound-proofing materials company arrives in a prospect's office with a portable tape recorder. First, he plays a tape of the sounds heard in a customer's office before the installation of his ceilings—bedlam. Then, at the same volume, he plays a hushed “after” tape. When the dramatic difference has sunk in, he spins a third tape—play-back of the noises in the prospect's own outer office just minutes before.

“I seldom have to add much to that demonstration,” the salesman reports.

It has been the experience of one automobile dealer that the solid slamming of a car door can go a long way in establishing a quality image in a prospect's mind.

But what about the product that, by its very nature, is mute?

The answer comes from J. P. Millon, sales manager, Coty, Inc., who says, “When the product can't talk, it's up to the salesman to put it across verbally.

“When you're introducing a new product to a buyer, you must engender curiosity, interest, enthusiasm. It's not enough to have a story to tell. You have to tell it with fire. Before he even takes an item out of its case, our salesman will confide, ‘Do I have something for you!’ While opening the case, he'll say, ‘This perfume is like nothing you've ever handled before.’ Up goes the lid. ‘Why, it's been jamming counters from Frisco to Philly.’ Down goes the lid. ‘Jones in Cleveland sold ten dozen the very first week.’

“By the time the buyer smells the perfume, he's genuinely excited. Then it's relatively easy to get him to sign an initial order for half a gross.”

No matter what you sell, you can dramatize it with vocal showmanship.

#### **MAKE HIM FEEL IT**

A hardware salesman had a retail customer who wasn't selling the number of tools his store traffic in-

## MARKETING

licated he should be moving. An examination of the customer's display racks gave the salesman an idea. Receiving permission to make certain changes, he proceeded to rearrange the tools so that their handles poked invitingly out, *toward* the ultimate consumer. Sales soon boomed.

"The display showed the merchandise, all right," the salesman explained, "but now your customers are tempted to grip the tools, heft them—and sell themselves."

The best demonstration of all is the self-demonstration. Get your product into a man's hands, where he can feel it, test it and otherwise "rehearse ownership" and you have done all that can reasonably be expected of a salesman.

Even if your product cannot easily be handled, some ingredient—some part—of it probably can. Dissect it, if necessary, to find out which part can be dramatized.

Revere Copper and Brass Inc., for example, proves that its copper-clad stainless steel transfers heat more quickly than ordinary steel with an ingenious "heat-stick," half of which is made of ordinary steel, half of "Copperclad." Revere salesmen ask their prospects to hold either end of the "stick" between their fingers, then light a match under the middle. Invariably, prospects release the Copperclad end before the other is more than warm. They cannot deny the testimony of their own fingers.

### USE SOME PROPS

Sometimes, when a selling point defies direct appeal to the sense of touch, it is possible to use something else in its place.

Case in point: the food salesman who, searching for a dramatic way to highlight the rapid turnover of his line, found ideal props in a coin, a pack of cigarettes and a rubber ball.

"Using only your forefinger," he challenges a prospect, "try to turn over each of these items."

As the dealer struggles with the problem, the salesman continues: "The coin that's giving you so much trouble represents an unknown line; the cigarette

pack is one that people have heard of. But the ball that rolls so easily is the line I'm speaking about. Because of our advertising and well-known quality, it will turn over faster and easier than any of the others. And that means more money for you."

Somewhere among the benefits you have to offer, there is one—or more—that can be made similarly concrete. Find it and let your prospect touch it, feel it, handle it. In a surprising number of cases, he'll do your selling for you.

### THE OTHER SENSES

A salesman for a paper container manufacturer enters a prospects' offices armed with two containers of coffee. He asks the prospect to sip from the first without identifying it as his own. After the smile of satisfaction has disappeared from the buyer's face, the salesman offers him the second. That second sip is always followed by a grimace.

"It's the plastic coating in our container that makes the difference," he explains, then goes on to button up the sale.

A book agent carries a leather-bound volume as a sample. No sooner does he gain entree to a prospect's home than he whips out the book and says, "Smell that! Genuine leather—and only seven cents a day!"

True, not every product lends itself to demonstration through the senses of taste and smell, but more do than most salesmen suspect.

It is almost an axiom of the food business to offer a retailer a taste of the product he is being asked to stock. But what about the paper salesman who tells his prospects, "Taste it," thus emphasizing the purity of his merchandise? Hasn't he successfully adapted a demonstration technique from another field and made it outstandingly his own?

What of the auto dealer who draws attention to the "new-car" aroma of the upholstery to fashion-conscious wives of prospects? Isn't he pointing out a novel way of *experiencing* the prestige of owning his product?

The salesman who overlooks any technique that will make his prospect aware of his product's advantages is voluntarily cutting his own income.

On the other hand, the man who constantly searches for ways to capitalize on his product's built-in drama—either by drawing on his own imagination or borrowing from other fields—is assured of an attentive audience. And an attentive audience is a buying audience.

In a golden nutshell:

1) *Examine your product to discover its unique advantages.* Is it made by a special process? Does it work in an offbeat way? Can it do something nothing else can?

2) *Ask yourself how these advantages can be most appealingly experienced.* Through the eyes? ears? hands? nose? tongue? (The more senses engaged by a demonstration, the better.)

3) *Tailor your demonstration to the senses you choose.* Should your product be magnified? miniaturized? explained in terms of "props?" Can you show what it does *not* do (make noise, add to discomfort, create a bad odor or taste)?

"Tell 'em to sell 'em" goes an old selling maxim. To which we might add, "Show 'em to sell more." ▲

### THE BEST DEMONSTRATOR OF ALL

Bill Stanley, a salesman of unbreakable glass, consistently outsold the other men in his district. Curious, his manager accompanied him on a sales call.

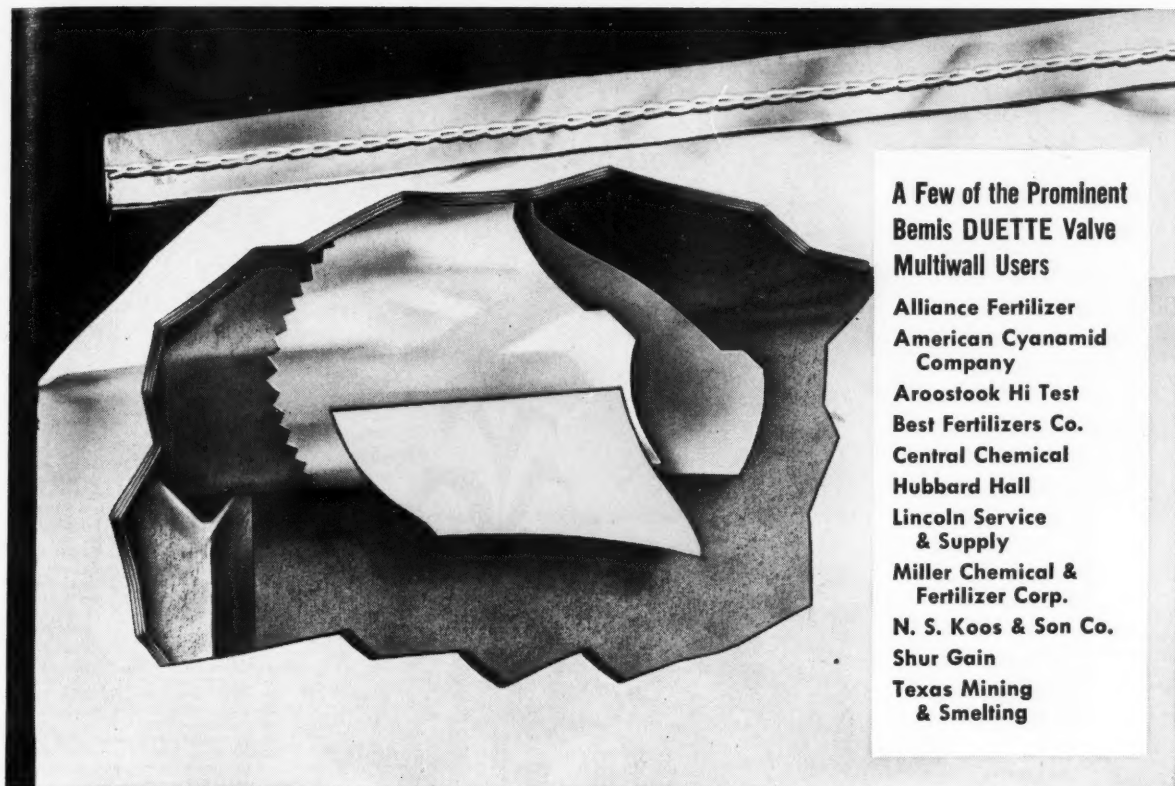
Bill's presentation was not discernibly different from that of the other salesmen. His samples were identical with those carried by his colleagues. He stayed no longer than was usual.

His secret?

Whereas other salesmen demonstrated the strength of their glass by striking it with a hammer, Bill made it a point to hand the hammer to his prospect and invite, "Try it for yourself."

Good advice.

# Bemis *Duette*<sup>®</sup> Sewn Multiwall Sleeve Valves Have Been Experience-Proved

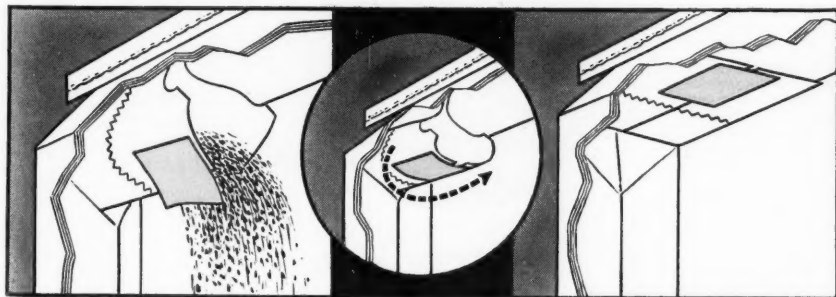


## A Few of the Prominent Bemis DUETTE Valve Multiwall Users

Alliance Fertilizer  
 American Cyanamid Company  
 Aroostook Hi Test  
 Best Fertilizers Co.  
 Central Chemical  
 Hubbard Hall  
 Lincoln Service & Supply  
 Miller Chemical & Fertilizer Corp.  
 N. S. Koos & Son Co.  
 Shur Gain  
 Texas Mining & Smelting

It's been more than three years since Bemis perfected the DUETTE, the multiwall bag valve-on-a-valve that gives double sift protection for granular, pelletized or pulverized products.

In that time, DUETTE Multiwalls have been used by many of the leading chemical and fertilizer manufacturers, with consistently gratifying results. The diagrammatic pictures show why . . .



**WON'T CLOG . . .** The Magic Yellow check flap falls freely aside from the valve slit. The sleeve won't choke or clog the packing spout.

**POSITIVE CLOSING ACTION . . .** This diagrammatic picture shows the action as the Magic Yellow flap starts to close over the valve slit.

**CAN'T SIFT . . .** When the bag is filled, the flap, acting as a check valve, completely overlaps and covers the valve slit, to stop sifting.



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## DIAZINON INSECTICIDE

Versatile effective organic phosphate insecticide for long residual fly control, multiple insect control on most fruit and vegetable crops. Extensively used by PCO industry for control of roaches and other household insects. May be formulated for household insect sprays.



## Geigy

### METHOXYCHLOR INSECTICIDE

Multi-purpose insecticide. Long residual action against many insect species attacking fruit, vegetable, forage crops, and stored grain. Controls horn flies, cattle lice and ticks on livestock.



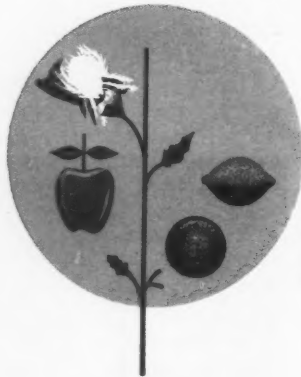
## SIMAZINE HERBICIDE

Pre-emergence herbicide for use on corn. One application gives season-long effective weed control. Safe to corn. Performs best in areas where rainfall is normally expected 10 to 14 days after planting. Also for pre-emergence use on nursery stock, and at higher levels of application, as an industrial herbicide. Extremely low toxicity to humans and animals.



## ATRAZINE HERBICIDE

New pre-emergence herbicide for use on corn. Higher solubility than Simazine. Recommended especially for use in drier areas. One application provides season-long weed control. Safe to corn. Extremely low toxicity to humans and animals. At higher dosage rates, Atrazine is used as a non-selective pre- or post-emergence herbicide for industrial weed control.



**CHLOROBENZILATE MITICIDE**  
Safe, effective miticide for use on deciduous and citrus fruit, ornamentals and nursery stock. Long residual action.



**SEQUESTRENE® METAL CHELATES**  
Original metal chelates in agriculture. For correction of minor element deficiencies of ornamentals, fruit trees, vegetables, turf. Compatible with most commonly used insecticides, fungicides, fertilizers.



ORIGINATORS OF DDT INSECTICIDES

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*FC begins  
an exclusive  
weather  
service for  
the industry*

FARM CHEMICALS is instituting an exclusive service in the farm chemicals industry this month.

Our aim is to help the industry anticipate and avoid bad weather in its marketing activities.

As brought out by the author of the accompanying article, this is not a "weather forecast," but rather a compilation of thirty years of rainfall records for 200 U. S. Weather Bureau stations located throughout the country. With the use of *past weather records*, FARM CHEMICALS hopes to help the industry reduce its *future weather risks . . . the only reliable way in which weather information can be used for planning more than a few days ahead.*

We'll let the author discuss this in more detail in the follow-

ing pages. However, there are some important things we want to discuss with our readers concerning the *use* of this weather information.

To begin with, we will bring you just anticipated rainfall. However, we are prepared to present nation-wide information about temperature, frost, humidity, etc. But *first* we'd like to have you tell us *how* you plan to use the material presented in this issue for next month. We'd appreciate it if you would be *specific*. Also how would you use *additional* information about the weather.

Your complete cooperation will result in a weather service that will undoubtedly be of great service in helping to market farm chemicals more *profitably* for everyone.

# may RAINFALL PROSPECTS



By VAUGHN HAVENS  
*Meteorologist, Rutgers University*

**T**HE ACCOMPANYING maps indicate for the continental United States the chances of receiving various amounts of rainfall in May. The data are presented in percent probability which can easily be converted into odds or risk of a certain event occurring or not occurring. For example, 80% probability represents the likelihood of occurrence of an event 80 chances out of 100, or 8 times out of 10. Another way of expressing this same information would be in terms of odds. Thus 80% would mean odds of 8 to 2 in favor of a certain event or 1 chance out of 5 that it will not occur.

This information is not a "weather forecast" in the usual sense. In fact, forecasts for a month or more in advance have very limited accuracy, although such forecasts are attempted. If these forecasts are used for planning purposes they can be more harmful than helpful since the user has no way of judging the risk of a plan-

ning error due to an erroneous forecast, nor any indication of the confidence which he can place in the forecast.

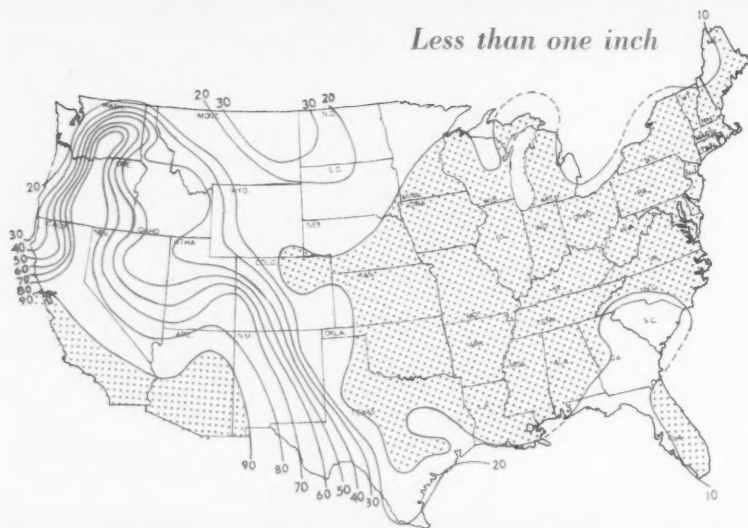
The information presented has been compiled from thirty years of May rainfall records for 200 U. S. Weather Bureau stations in every section of the country. The period used was from 1928 to 1957 in all but a few cases. This is an example of the use of past weather records for determining future weather risks, the only reliable way in which weather information can be used for planning more than a few days ahead. Day-to-day operations, however, should be planned with the aid of the latest weather broadcasts.

Of course, the application of climatological probability to long-range planning in agriculture, business and industry often involves other weather factors in addition to rainfall. The use of climatological information is usually most successful when the user is able to see

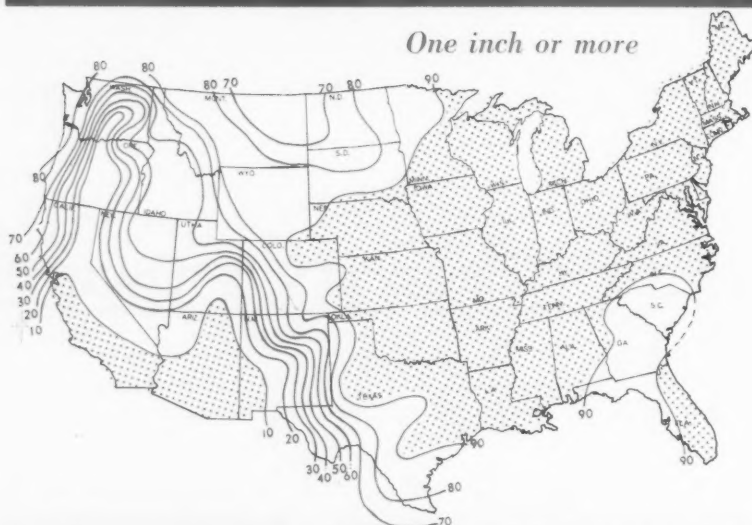
# may RAINFALL

% Probability

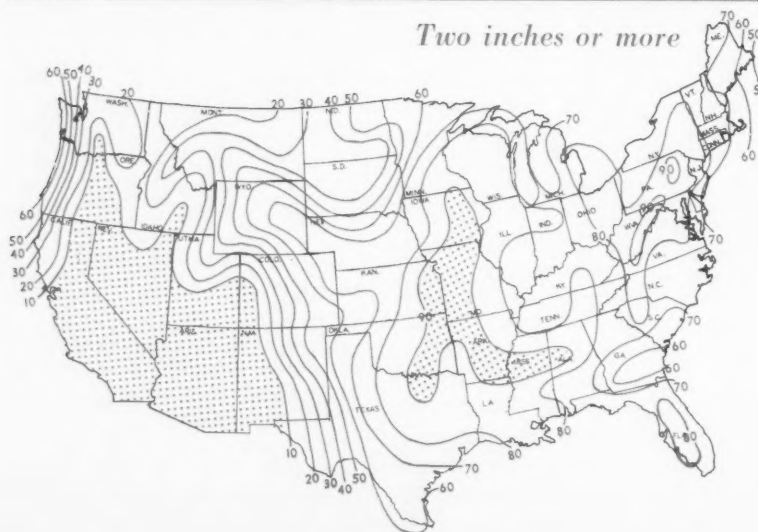
*Less than one inch*



*One inch or more*



*Two inches or more*



clearly the roles which the several weather elements will play in determining the success or failure of some future operation or activity. Having done this, he can convert weather risks into calculated operational risks. He can thus make his long-range plans so as to minimize the risks involved and maximize his chances of success.

One could cite numerous examples of the application of climatological probability to long-range planning of a wide variety of activities, ranging from the selection of the most promising time and place for next summer's vacation to the months of study and planning which preceded the invasion of Western Europe in June 1944.

Probably the best known agricultural example involves determining the risk of frost on or after various dates in spring. With this information, a farmer can balance the advantages of early planting against the risk of loss due to frost and thus select his most advantageous date. In this example, as in all uses of climatological probability, no attempt is made to forecast the date of the last spring frost in any particular year, since this would be practically impossible. A weather risk figure based on thirty years or more is, for all practical purposes, a constant. Thus, if a New Jersey tomato grower decided to set out his plants on a date when the risk of frost dropped to 20%, he could expect some frost damage requiring re-setting of plants on an average of 2 years out of ten; which two years these may be is anybody's guess.

## HOW TO USE THE MAPS

The maps of May rainfall probability are intended for use in a similar way. A few simple examples may help to visualize the possibilities, even though your own problem may be more complicated. Suppose your plans for May would be seriously hampered if the month brought less than one inch of rain to "your area." Under these conditions, if your area happened to be northern Arizona or central California the odds would be about 9 to 1 against you. You would probably be wise to reconsider your plans—and then plan something else. On the other hand, if "your area" were central Minnesota or Georgia, the odds would be about 9 to 1 in your favor, or in other



words, May rainfall would be unfavorable for your purposes only about once every ten years.

Now imagine a year in which the spring has been very dry so that your plans will be seriously effected unless May produces 4 inches or more of rain in your area. In this case, if "your area" were western Kansas or northern Illinois, you could expect 4 inches or more in May only about 1 year in 3. Thus the odds would be 2 to 1 against you. But if "your area" were central Missouri you would have better than a 60% chance of success.

#### HOW THEY WERE PREPARED

These maps have been carefully prepared from some 6000 records of May rainfall. In mountainous terrain, however, they should be used with caution since differences in elevation and exposure to the prevailing winds can cause large differences in rainfall between nearby locations. In addition, a certain amount of smoothing of the data was required in certain areas in order to eliminate minor variations and highlight the more important features of the rainfall distribution.

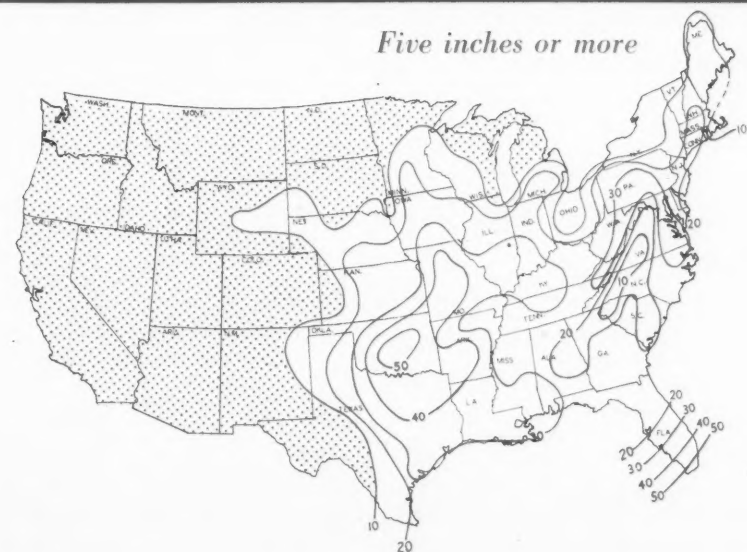
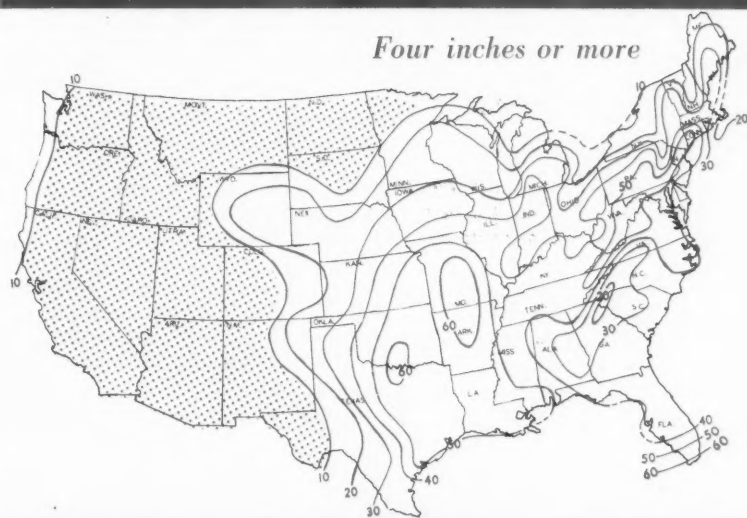
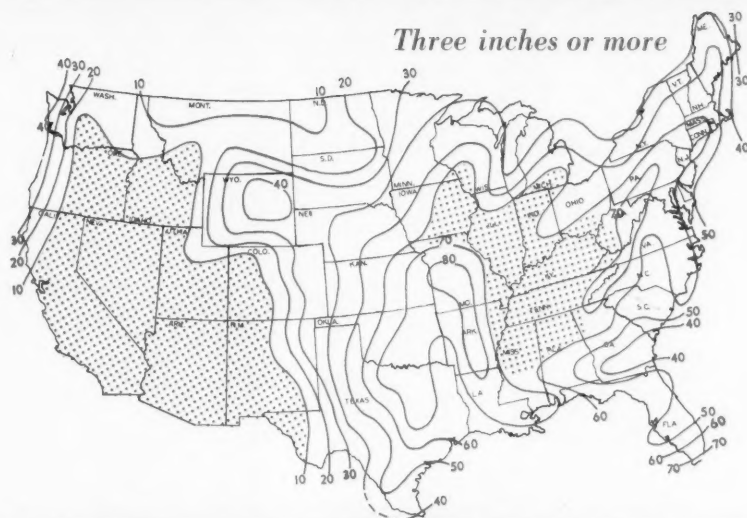
In the areas beyond the 10 per cent and 90 per cent iso-lines, we can only say that the chances are less than 1 in 10 and more than 9 in 10 respectively. For example, in the map at top left, all stations east of the 10 per cent line have recorded less than one inch of rain in May fewer than 3 times during the 30 years studied. Some stations of course have never recorded a May rainfall of less than one inch. This does not mean that it cannot happen at some future time, but only that it is extremely unlikely to happen.

Similarly, the central shaded area on the "two inches or more" map is an area where the rainfall in May has been two inches or more in more than 27 of the 30 years studied. One station in this area has never recorded less than two inches in May. Again, this does not mean that it will never happen, but only that the odds are very much against it.

Rainfall was chosen for this initial set of maps because of its obvious importance to many agricultural activities. However, similar treatment of many other weather factors is possible and doubtless would be required for certain types of planning problems. ▲

% Probability

## may RAINFALL



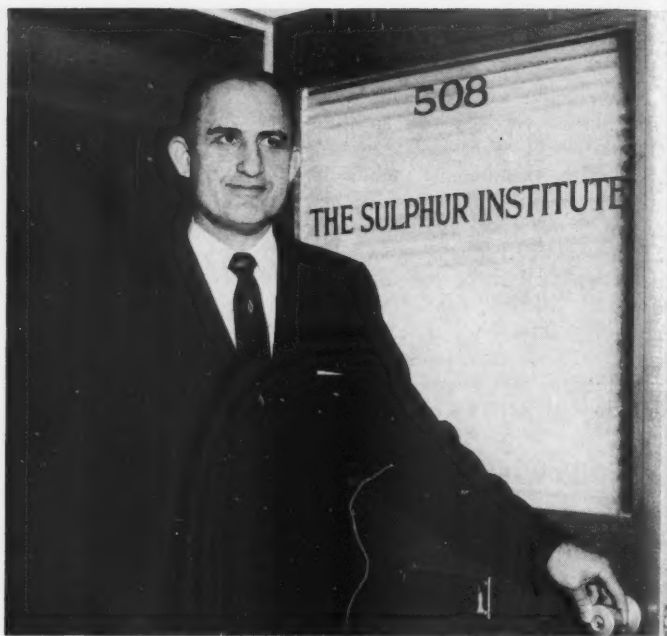


S. L. Tisdale



M. S. Williams

# the Sulfur story



New challenge faces Dr. Coleman as he enters Sulphur Institute office.

**E**XPANSION in sulfur production at the rate of about 5 per cent annually has producers seeking new end uses for the element. Dr. Russell Coleman, president of the newly-formed Sulphur Institute, told FARM CHEMICALS last month:

*"We're going to put some romance in this business of sulfur research. We're just beginning to look over the horizon of broad opportunities in expanded uses for sulfur."*

Although sulfur has an estimated 32,000 industrial uses, agriculture claims 40 per cent of its total production—with about one-third of all sulfuric acid going into fertilizer production.

The new concentrated superphosphates used in compounding fertilizer mixtures eliminate large quantities of sulfur needed in our soils.

"Ways must be found to put this sulfur back in the soil," Coleman said.

He said that various application methods will be studied, such as a soil amendment, an additive to fertilizer or some other means not yet devised.

## "SOUR GAS" NEW SOURCE OF SULFUR

Increasing demand for natural gas has produced large quantities of sour gas—a new source of sulfur. New and prospective producers of natural gas have joined the major sulfur and pyrite producers to seek ways of utilizing this expanded production. Here is the estimated annual world production at the present time:

	long tons
Frasch process.....	6,000,000
Sulfur contained in pyrites.....	6,000,000
Natural mining.....	500,000
Sulfur recovered from natural gases.....	1,500,000

14,000,000

Coleman told FARM CHEMICALS that use of high analysis fertilizers has created sulfur deficiencies in some parts of the country. It's been known for some time that a shortage of sulfur exists for alfalfa grown

on the Palouse and Ritzville soils of Washington, Idaho, and Oregon.

Deficiencies of this element have occurred on cotton and tobacco on the sandy, coastal plain soils of Alabama, Georgia, Florida and North Carolina. It has also been reported on tea plants grown in tropical zones of the world. Also, sulfur has been reported to have increased the yield of clover on the sandy soils of Florida.

Coleman said that in several states such as California, sulfur is now regarded by some soils specialists as the No. 2 element under certain local conditions.

The Sulphur Institute will seek the answers to questions like these:

- ▶ What is the soil and crop inventory on sulfur?
- ▶ What is the most economical method of applying sulfur to the soil?
- ▶ What is the best method of determining sulfur deficiencies—run a sulfur test along with the regular NPK test?
- ▶ What is the effect of rainfall-produced sulfur on soils close to industrial centers?

The Institute, which has been incorporated under the laws of the State of Delaware, will hold its first membership meeting and Board of Directors meeting in Paris in early May.

Recently appointed to the staff were Dr. Moyle S. Williams, chief economist, and Dr. Samuel L. Tisdale, chief agronomist, both of whom were formerly with the National Plant Food Institute. Williams held the position of chief economist and Tisdale was South-eastern regional Director for the NPFI.

Williams will be in charge of economic research and development. He will also serve as economic advisor to the Institute staff, and will provide liaison between the Institute and professional organizations and institutions concerned with economic research in both the industrial and agricultural fields.

Tisdale will be in charge of the Institute's program of research and education in connection with the use of sulfur for agricultural purposes.

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**SQ<sub>2</sub>D<sub>2</sub>TA**

**X**

## The **DAVISON** formula that multiplies your profit potential

There's a formula for practically everything in the fertilizer industry. There is even one for **PROFIT**—the exclusive Davison formula **SQ<sub>2</sub>D<sub>2</sub>TA**.

It is symbolic of the *extra effort* put into every Davison product. With every carload of phosphate you get a generous shipment of properly proportioned amounts of Service, Quality, Dependability, Delivery and Technical Assistance . . . all working together to help you realize a higher profit on your operation.

It goes almost without saying that Davison is satisfied only with the utmost accuracy in its phosphate formulas, with precision care in processing. The end result is a Davison product you can be sure is unexcelled in its field.

Try a test carload with the Davison *Plus Factors*. Call us today about your needs—Saratoga 7-3900, Baltimore.

Hi-Flo Gran-U-Lated Triple Superphosphate • Hi-Flo Run-O-Pile Triple Superphosphate • Hi-Flo Blend-Phos Triple Superphosphate • Granulated Single Superphosphate • NEW Run-of-Pile Single 20% Superphosphate • Phosphate Rock—All grades • Phosphoric Acid • Sulfuric Acid • Oleum • Granulated Diammonium phosphate 16-48-0

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# MARKETING RESEARCH

## and its importance to farm chemicals manufacturers

By MANUEL H. PARSEGHIAN

**Y**OUR INDUSTRY has been expanding at a very high rate. All indications point to a favorable long-run outlook. The growth of population, for one thing, will call on agriculture to produce even more than it presently does, in spite of present surpluses.

With the expansion of the suburbs into what are now rural areas, this increased production will have to come from even less land.

Look at the removal of plant food from the soil and the low rate at which they are replaced. This is a further indication of the high potential even in today's situation.

In 1950, for example, if all farms had followed the recommendations of state experimental stations, the industry would have needed twice its capacity to meet the demand as it existed. This all serves to point up that the trend toward acceptance of fertilizers seems to be slow—far below what it might be. There certainly seems to be no dearth of variety or flexibility or physical availability, but there is a large untapped potential. The question then is why.

From the studies that have been done around this problem, it seems that the basic need is to educate the

farmer in the uses and benefits to be derived from the use of farm chemicals.

*This is a marketing type of problem, but it shouldn't be just an up-dating of the notion that people will buy what I make just because I make it, if they know about it. In its final form, the marketing concept calls on the producer to govern himself by what his consumers need and want.*

Therefore, behind the statement that the potential market for farm chemicals can be developed by educating the farmer in the proper use and benefit of fertilizers or of farm chemicals must lie an appreciation that this is best accomplished (most economically and efficiently accomplished) by taking into account the farmers' needs and wants, both in the education process and in the production and marketing processes.

These are areas in which market research can be applied, with the realization that the consumer's importance is the final arbiter of executive decisions.

The planning of the company's efforts in such a way as to maximize sales and profits becomes a combined effort between producers and marketers as they work planning new products, scheduling, designing, packaging, distribution, selling, pricing, and many other areas in which executive decisions have to be made.

*By providing accurate information for decision-making and planning, market research makes its contribution.*

### A BROAD AREA OF PROBLEMS

The kind of questions raised which market research is called on to provide answers for occur in many areas, but principally they are concerned with the characteristics of the market, the size of the market, the distribution, advertising, production and competition.

This represents a broad area of problems, as you well realize, and the number of questions that could arise in them is quite numerous.

Answering them is not always an easy task. The question then is appropriate, in the face of this tremendous chore, *is market research up to the task?*

A number of techniques have been developed over



MANUEL H. PARSEGHIAN, Account Executive, National Analysts, was graduated from Ursinus College in 1951 with a B.A. degree in history and political science. After three years service in the Army, he attended the Wharton School of the University of Pennsylvania and majored in marketing. He received his M.B.A. degree in 1956. Before joining National Analysts in 1956 he taught marketing at the Wharton School and at the Charles Morris Price School of Business. In

his present position he is in contact with clients and other firms to discuss their marketing problems and develop suitable research plans to solve them.



Another outstanding contribution of the first Farm Chemicals Marketing Seminar (FCMS), sponsored by FARM CHEMICALS last November 16-17, was a discussion on "Marketing Research and Its Importance to Farm Chemicals Manufacturers" by Manuel H. Parseghian of National Analysts, Inc., Philadelphia.

Parseghian stressed that marketing research refers to the use of scientific methods in the solution of marketing and distribution problems for the purpose of increasing sales, decreasing marketing and distribution costs and maximizing profits.

He added that "its very existence and its value to management rests on what is called the Marketing Concept." Its growth parallels the acceptance of this concept by American industry.

"Its chief utility lies in its ability to provide manage-

ment with accurate and timely information about marketing," he continued.

"As industry has grown, the cost of entry into business, the capital required—and conversely the cost of having to go out of business—have become increasingly higher."

Parseghian explained that "with increasingly greater competition, the ratio of net profits to sales has grown ever smaller for most businesses, and this precludes any mistakes that can be costly to firms—such as producing the wrong kind of products or tying up investment in inventories unnecessarily."

FARM CHEMICALS presents Parseghian's remarks in the light that he intended them for FCMS—to point up how much more important it is now than ever that a producer have some previous assurance that a market exists . . . that it is large enough to support him . . . and that it wants what he has!

the years to answer the kinds of questions that marketing people raise. Part of the awareness of the kind and accuracy of information that research is able to obtain has come about through the adaptation of knowledge and techniques from many branches of the social and the behavioral sciences, through the application of statistical techniques and through the growth of marketing as a subject worthy of independent study.

Basically, though, market research is a way of doing things. It is, to put it tritely, a way of life. It is not a set of answers and facts like an encyclopedia, but it is a method or way of finding answers and facts.

As a method and a set of techniques, it provides a channel for the steady flow of information about markets, which other methods cannot do.

#### **DOES THE INDUSTRY NEED MARKET RESEARCH?**

*The question now is whether this method or way of life is of any value to marketing in the farm chemicals industry.*

I think perhaps a way of finding this out would be to review some of the kinds of marketing decisions that have to be made in that industry to solve its basic marketing problems.

What kind of problems do I mean? They all relate to sales ultimately, but we need to be much more specific than that. If you ever get tangled up with market research, you will soon find out that specifics are very important.

*The general problem is sales, but the particular problems relate to products to sell, relate to packaging for the problem, relate to advertising and distribution to the consumer.*

It means also setting a price for the products and possibly follow-ups on sales for providing products to the consumers, both before and after and providing products to meet the market's needs and desires.

Of course, all of these things need to be done in a particular marketing situation and in terms of each firm and its particular goals, management's desires and capacities, its physical limitations and its own

sometimes peculiar marketing situations.

A number of important changes are taking place in farming which have some bearing on the development of farm chemical sales. For one thing the farm population is changing both in characteristics and in politics.

#### **TWO FARM POPULATIONS TO CONSIDER**

For example, we are witnessing the growth of two farm populations which have some significance to suppliers of all kinds of products to the farmer.

Owing to their different characteristics, each of these populations are probably possessed of different basic attitudes and market behavior.

What I speak of here is the increase of the number of farmers working part of the time off the farm, and the increase of the off-the-farm income. This can be associated with changes in the effective size of the farm, nature of the operations, and the types of crops grown.

The full-time farmer is operating a larger farm. He is putting more of his land into crops, and he is more managerial in his approach to farming; that is, he operates more as a businessman.

The part-time farmer, that is, the farmer who works off his farm at least a hundred days in the year, tends to have a smaller farm and put less of it into crops. He concentrates on those crops that yield a high income and that are easy to care for, that take little labor on his part.

*These people can be expected to use better seed and perhaps more fertilizer to obtain better yields per acre or what is probably more in their line of thinking per hour of labor.*

In their case, farm purchases and family purchases compete more directly for available dollars.

This development will probably increase with movement of industries to small cities and suburbs and rural areas, which provides greater opportunities for those now on farms to find off-the-farm employment.

Basically, the part-time operator is quite different

## MARKETING

from his full-time brother. It is not a case of just less of the same thing or a smaller scale. There is a difference in the products they raise and the effect of land use.

*This growth in one segment of the farm population suggests an opportunity for marketing development that has not before existed, and points at a need for more information about this segment to determine what the characteristics of the part-time farmers are, so that their probable market behavior can be predicted and planned for.*

In particular, it might be of some value to know about the amounts and sources of their income, their uses and attitudes toward the use of this income for farm versus family purposes, the pattern of land use, their operating and work habits. These all have a bearing on the demand for equipment, seed, fertilizer, and so on.

Their attitudes toward the use of time would be significant, and so would knowing something about their patterns of living and striving, both economic and non-economic, and their role or orientation, which is a nice word that sociologists and psychologists use, toward farm versus industrial life.

Some of these are rather abstract notions, but they all seem to have some importance in arriving at an understanding of the current marketing situation in which the farm chemicals industry will have to function.

Developing a potential market that we all feel sure exists out there is in effect, however, asking the farmer—even those presently using the products—to make a change in his present practices.

There are many factors that should be taken into account that may facilitate or hinder such change. For example, it took about fifteen years before the vast majority of the corn farmers took to using hybrid seed corn.

### FARMERS' RESISTANCE IS DEEP-SEATED

On the surface the change would have seemed a very simple one in materials. Part of the problem lay in the lack of availability of seed corn to start with, but there seems to have been considerable resistance, at least in the early stages of the availability of hybrid seed corn. Even deep-seated resistance had to be overcome.

There was fear on the part of farmers of now having total reliance on commercial sources for seed corn.

The change also implied loss of skill status. He could point with pride before at a good crop and thereby imply his ability to select good seed corn from his own crops.

### "PRESTIGE" IS A MAJOR FACTOR

*There was thus a loss of independence and a loss of prestige involved in making this change.*

Such factors may exist and be important, even when not suspected. It is therefore prudent for management to do everything possible when making a change or asking for a change by first realizing fully what it is asking for and doing what it can to overcome points of resistance.

Information on these factors developed by means of

market research can be of assistance in planning changes, being cognizant of opportunities, and facilitating their adoption.

The company I work for, National Analysts, is a market research agency, and has conducted a number of studies among the farm population about some aspects of agriculture, both for the government and for industry.

Some of these studies have been directly concerned with farm chemicals and fertilizers and farm machinery. The work we have done, some of which I have already alluded to, has developed quite a lot of information about the characteristics of farmers, in particular of those farmers included in low, medium, or high users of fertilizers.

Though I may be speaking here primarily of fertilizer, I think most of the remarks, at least the principles, are applicable to other types of farm chemicals as well.

### HIGH LEVEL VS. LOW LEVEL USERS

*By high users or low users, I don't mean just large-volume purchases. What I refer to, as far as high user, for example, is a user who is a person who uses approximately the recommended or most economical amounts of fertilizer for his particular crop in his particular soil as determined by agronomists.*

These people's attitudes toward the whole situation have been gone into to quite some extent. We have found, for example, that high-level users have different characteristics from low-level users. They are younger. They have been farming for a shorter time, but they are richer and have a bigger investment. They have larger farms. Their tenure arrangements are more complex, and they are not always lone operators. They derive more income per acre, and they are better educated, and generally have had at least some training in the agricultural field, training in the form of a course of some kind.

*They approach their work in a more businesslike and managerial fashion, and they are more aware of economic and marketing conditions.*

Low-level users, on the other hand, see the use of fertilizer as a desirable goal and consider fertilizer use to be one mark of a good farmer, but they still prefer animal manure and see commercial fertilizers as a substitute. They can't really tell one analysis or brand from another. They are not always aware of the proper conditions under which fertilizer should be used. They blame the weather for failure and say they can't afford fertilizer.

The question is, so what? What can we do about it? Gathering such information is often costly and sometimes substantially so.

I have already pointed out some of the areas in which market research information can be applied, and in general some of the purposes for which it is used. For the moment then, let us deal with a specific and see what happens. As I mentioned, we found that low-level users of fertilizer were, to put it one way, relatively untutored.

The world of fertilizer appeared to be much too complicated. They have had no training or information about it. Yet low-level users seemed favorably

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## Virginia-Carolina: "Michigans a big factor in reducing costs"

Time and time again it's performance that counts . . . and that's why the list of fertilizer manufacturers who own Michigan Tractor Shovels is long and impressive.

Virginia-Carolina Chemical Corporation is a good example.

One of their typical plants—at East St. Louis, Illinois—owns three Michigans. Their most recent report says the following . . . "Our Michigans (it reads) have turned in *major* cost-reducing, production-boosting performances!"

The story starts in 1956. That year, of the nine sizes of Michigans available, Virginia-Carolina chose the 16 cu ft Model 12B. Two of them were bought from Michigan distributor Bardale Equipment Co, St. Louis . . . the Michigan no-foot-clutch, power-shift transmission and fully-sealed all-Clark power train considered major benefits over existing equipment. The success of these machines led, as production demands increased, to purchase, in 1958, of the third Michigan Tractor Shovel.

When the above picture was taken,

the three Michigans had compiled a total of 23,100 working hours. Outside of a minor steering column failure, they had lost virtually no assigned work time.

Their assignment included (and still includes) handling of all kinds of material—superphosphate, muriate of potash, ammonium sulphate, and others. On a typical job—taking material from boxcars to conveyor hopper—one machine usually will make



about 40 shuttle trips an hour. The complete unloading task takes about two hours. Units also handle binned material, feed the batch scale, etc,

etc. Loads range from 880 to 2,000 pounds each.

Lifting *capacity*, incidentally, of these 12B Michigans is 3,000 pounds. A wide range of buckets are available, 9 to 27 cubic feet. For still greater capacity, there's a new machine—also with two-wheel-drive—the 1 yd (standard bucket) Model 55B. Also available are seven job-proved *four-wheel-drive* Michigans, ranging from the 1 yd Model 55A to the Model 375A which handles buckets up to 10 cu yd capacity. Your Michigan Distributor will be glad to demonstrate any of them. Ask him anytime—see for yourself why firms like Virginia-Carolina, Agrico, Armour, Swift, International Minerals, Olin Mathieson, Smith-Douglass all buy—and repeat buy—Michigan fleets.

Michigan is a registered trademark of  
**CLARK EQUIPMENT COMPANY**  
Construction Machinery Division

**CLARK  
EQUIPMENT**

2461 Pipestone Road  
Benton Harbor 21, Michigan  
In Canada:  
Canadian Clark, Ltd.,  
St. Thomas, Ontario



## MARKETING

disposed toward fertilizer use but are reluctant to change. There are many factors that can help or hinder change.

One factor that can be a serious impediment is lack of knowledge. Here we come back to the major problem of education and some of its implications.

### THE FARMER NEEDS MORE HELP

*I mean here lack of knowledge as to what new methods may be involved, what the implications of change are, what new skills may be required, what benefits are to be derived, and so on.*

The lack of understanding or poor understanding of these is a stumbling-block. They represent areas of information of importance to the farmer in using fertilizer, but also areas in which he is unfamiliar and cannot become familiar without some kind of help.

Because his knowledge is limited and because he sees the use of fertilizer as a desirable goal and the mark of a good farmer, the low-level user seeks information and advice. To him college publications and county agents rate as high sources for practical information. Neighbors and family members rate even higher, especially for advice on whether or not to use fertilizer.

Technical questions on analysis and amount are posed to professional agricultural experts.

### YOUR LITERATURE ISN'T BEING USED

*Incidentally, the manufacturers' literature rates very low. Sometimes the dealer becomes the source for information on form, analysis, and amount.*

Here then are some avenues through which the potential user of fertilizer can be used, but almost as important is to bear in mind the kind of information that the farmer or potential user seeks and expects to find through each of these many sources to which he applies.

Concerning the kind of appeals that should be used in and particular techniques by which the message should be gotten across, these are specifics, and I think quite individual problems which require the help of advertising experts.

The solution would differ for each individual marketer and would vary with such things as the characteristics of his particular market, the knowledge which the market has of him, their attitudes toward him, his product line, his state of development in the market, his methods of distribution, and a number of other factors.

Here then is another area in which marketing research can make useful contributions, but there is one further thing I would like to suggest.

### EXPLODING THE "UNIT COST" MYTH

One of the factors in making change is the demonstration of benefits to be derived from the change. I think it is important to recognize the way in which farmers receive the benefits of change, either change to fertilizer or change to the use of more.

In presenting the notion of change or benefits from change to the farmer, most people seem to talk about lower cost per unit. This results from a higher yield per acre with incremental revenue from production

more than offsetting the cost of production.

*There is a question as to whether this has any meaning to the farmer and whether he thinks in these terms or not.*

As regards an investment in fertilizer as a financial risk with uncertain benefits, he tends to relate fertilizer use to greater production. In other words, the terms which he thinks of as far as benefits to be derived is production rather than unit cost.

### HOW PART-TIME FARMERS THINK

The part-time farmer whom I mentioned earlier thinks in terms of effort or labor expended or output, so the suggestion is to talk not in terms of cost per unit but rather in terms of increased yield or ease.

This is something he will understand and something familiar to him and also something he can see in his field and in his operations.

*Lower cost per unit is an accounting concept. It is an abstraction. He can't put his finger on it, but he can count the additional bushels that come out of an acre.*

What I am saying is that what is said to the farmer should be said in his own language, in terms he understands and uses, and benefits presented to him which he values and aspires toward and will appreciate.

*Farmers, after all, are not agronomists or plant physiologists, but are businessmen for the most part, willing to listen, as most of us would be, to someone who can tell them how to do a better job.*

What must be said in advertising should be guided by the farmer's attitude toward his job, his level of knowledge, his goals and aspirations, and his perception of the role that farm chemicals play in the achievement of these goals and aspirations.

### TWO TYPES OF MARKETING RESEARCH

There are two types of market research which I think have special significance to farm chemicals marketing.

*The first of these, called survey or consumer research, is done by asking people questions or observing how they behave in certain situations. This is the kind of research that develops information about consumers' characteristics, their habits, their motives, their attitudes, and the like of that.*

It is the kind of research I have been talking about so far. The second type of research is distribution research. One aspect of this deals with the characteristics of dealers, the levels at which they operate, their practices, the motivations of these dealers, their attitudes, and the efforts that they expend in selling your products.

*The other aspect has to do with distribution costs. There are presently available methods for measuring the cost of distribution by such things as type of outlet, order size, package size, type of customer, and location of customer.*

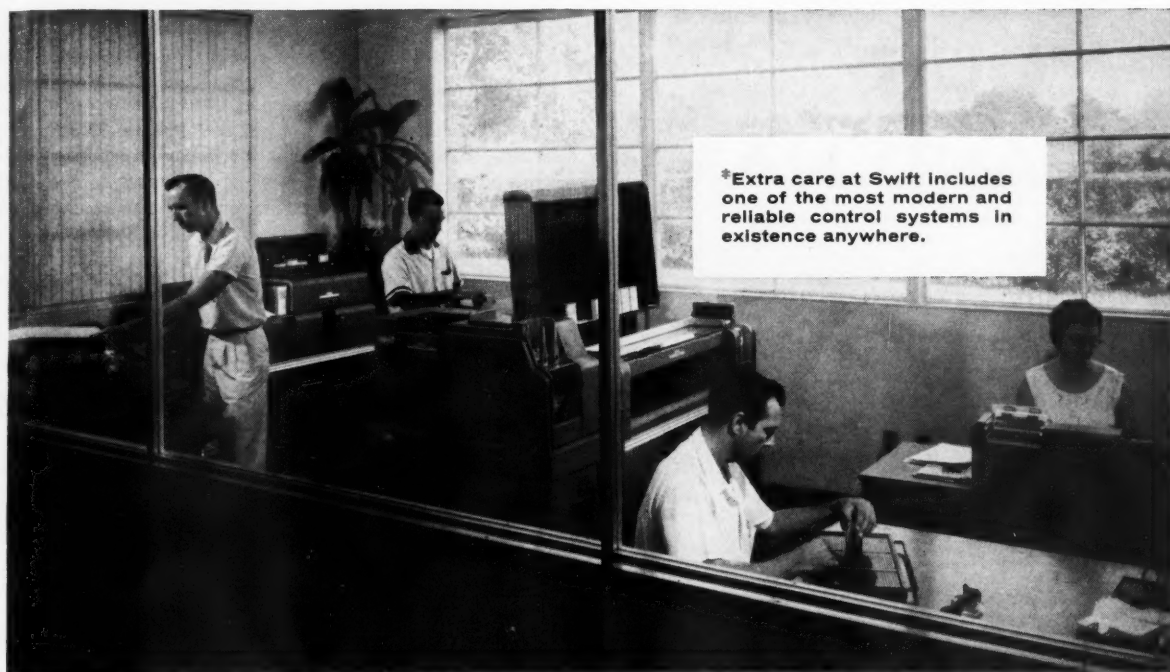
I think some of the implications of these types of research are already apparent to you. They are useful in attacking the other problems in the farm chemicals marketing, in addition to information, namely, of selling effort and efficient distribution.

The value of market research is that it can provide necessary facts on which to base decisions aimed at accomplishing growth and efficiency. ▲



Intensive customer service ...  
part of the extra care\* behind

## SWIFT'S PHOSPHATES



\*Extra care at Swift includes one of the most modern and reliable control systems in existence anywhere.

Swift's *extra care* is just as real as is the staff that provides it. Take Customer Service, for example. This is the department to call when you want information on cars shipped, car numbers, dates and routing. With the support of a modern, precise control system you get accurate up-to-the-minute information promptly. And this is just one part of the

whole Swift organization dedicated to providing better phosphate service.

Swift's *extra care* can help you even better satisfy your customers . . . your plant operations . . . and your profits. It's worth checking! Have a Swift Phosphate Center Representative outline the advantages Swift offers you in phosphates—Triple, rock or ground rock.

THE SERVICE CENTER FOR ALL YOUR PHOSPHATE NEEDS

**SWIFT & COMPANY  
PHOSPHATE CENTER**

.....Bartow, Florida.....



*To Serve Your Industry Better* WITH PHOSPHATE ROCK,  
GROUND PHOSPHATE ROCK AND MINUTE MAN TRIPLE SUPERPHOSPHATE

## **MERCHANDISING AIDS**

### **PROMOTION**

# **EXHIBITS**

## **help build**

## **YOUR**

# **BRAND NAME**

*Here are some tips in planning an exhibit for state and county fairs and other events—as well as what “manners” to observe at show-time.*



**W**HY does a progressive farm chemicals company consistently exhibit its products at state and county fairs, industry events, local shows and even high school events?

*The answer is simple: to publicize the brand names of products the company manufactures or distributes through its dealers.*

A year ago in our April issue, an article entitled “Now Is the Time to Plan Your Exhibit” explained the basics of producing an effective exhibit. Also, we published a guide as to how much you should expect to pay for various types of exhibits.

A New Jersey chemical company sales representative told FARM CHEMICALS recently that they purchased a small exhibit from an exhibit company for \$800 last year. Made of Masonite, part of which is perforated, it has a natural birch countertop. Shadow boxes were used for displaying chemicals, as well as illuminating some transparencies depicting some of their chemical operations.

The company chose its basic design from a group of simple sketches. Their advertising man made some additional sketches and colored them. From this they were able to come up with a distinctive idea that turned out to be a “crowd pleaser” at chemical symposiums in Chicago, Detroit and Baton Rouge, Biology Show in Atlantic City, “Chemical Progress Week”, industrial management shows, local exhibits and high school shows.

A moving display of some type should be made a part of the exhibit, suggests the sales representative. Psychologists say that motion has a very strong emotional appeal because it simulates or suggests life and activity.

Clocking tests have shown that an exhibit with some kind of animation stops more people and holds their attention longer than a “still” one.

Motion can be a very effective attention-getter or eye-catcher, but it should be more than this. Improperly used it can compete with your educational message for attention. Motion should not be used just for the sake of gaining attention. It should “sell” your idea and interpret or emphasize your important points.

With batteries or a simple motor an ingenious person can devise many ways to animate an important point in an exhibit.

#### **HERE'S YOUR CHECK LIST**

The more you outline both your objectives and plans in writing, the better your results will be. “Your exhibit will be as good as your plans and your results remarkably close to your objectives,” warn professional exhibitors.

Try to determine exactly what you expect to accomplish in your exhibit and be sure that everything you display carries out your basic purpose. Check these points:

*Accuracy:* Have you checked for proof of information in your exhibit? Is the information in proper sequence?





**Accent:** Have you concentrated on one point? Is the message obvious at first glance?

**Appropriateness:** Will the message create interest? Does the message describe the topic exhibited? Are samples, models, and other materials used effectively? Is the name of your company on a separate card, which can be placed toward the front of the exhibit? (The name should not be displayed in such a manner as to take away from the important spot in the exhibit).

**Color:** Have you used colors in attractive combinations? Have you used only a couple of outstanding colors?

**Lettering:** Is lettering large enough? Is the lettering neat and attractive? Are the letters and words spaced for quick and easy reading?

**Rapid reading:** Can the public understand at a quick glance the main point of your exhibit? Is the booth attractive enough at first glance to entice people to stop?

### MANNERS MEAN SALES

► You can add many dollars of sales and priceless goodwill to the value of a well-designed fair exhibit by proper guidance of the people who man it for you.

► Personnel who will be assigned to be in attendance at the booth should be selected well ahead of time and notified.

► The cardinal sin of exhibiting is to leave a booth

unattended. It is actually better to be out of a fair entirely than to present a bleak, unattended booth to passing visitors.

► Your booth and the people who conduct it, compose the only picture of your company most prospects will carry away. Make sure that your exhibit represents a good show-window of your imposing plant, charming management and well-informed salesmen.

► Salesmen must have all the facts on the fair and its audience and the company's objective in participating. Time should be provided to study competitive exhibits, for trade fairs are a showcase of ideas.

► Salesmen should never sit. An exception may be made when conferring with prospects.

► Nightly entertainment should never be carried over to the exhibit area. If after hours entertaining is a must, it should be done in moderation with the very valid excuse "tomorrow is a long, hard day in the booth."

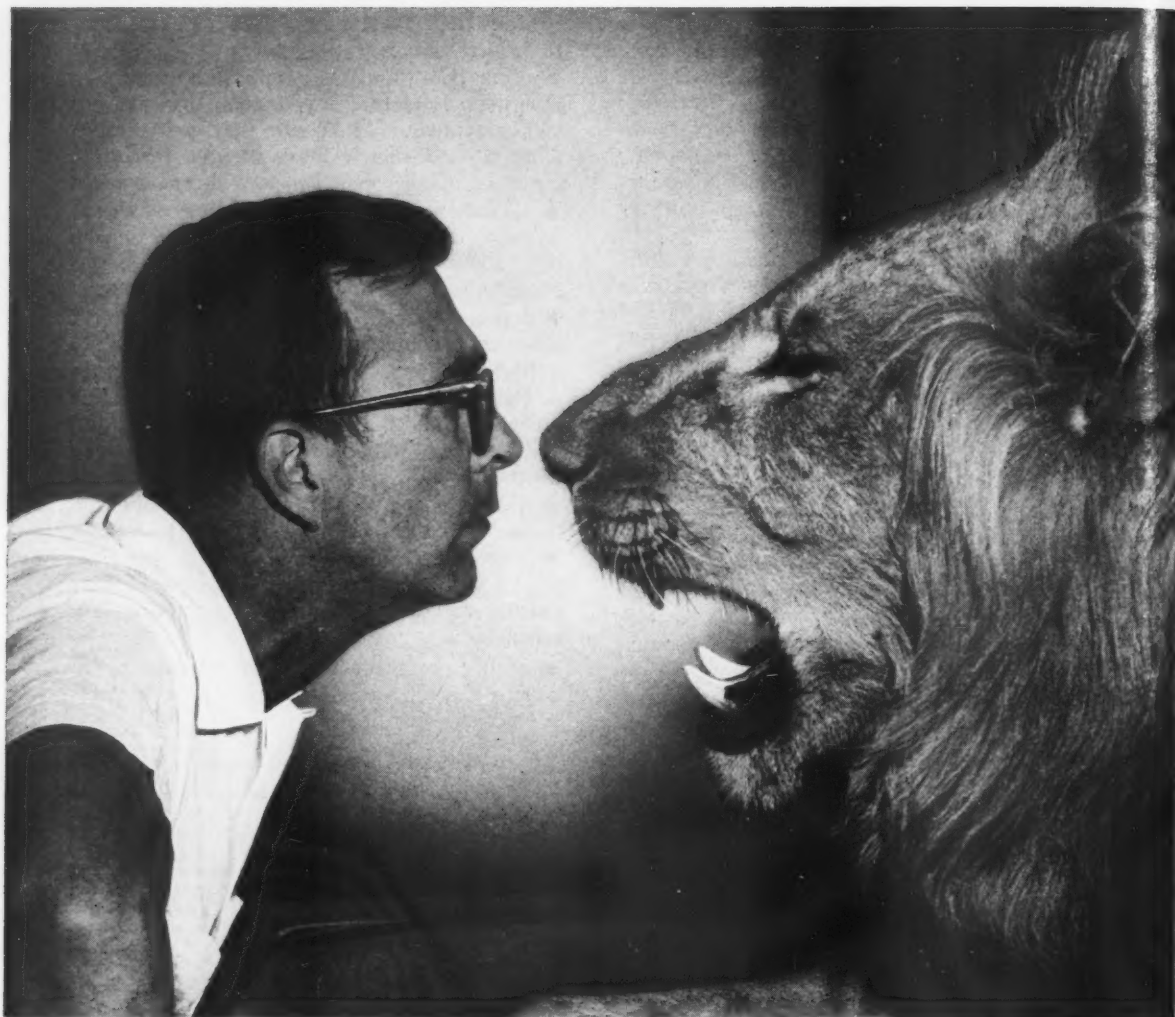
► Congregating of salesmen, aimless wandering, loud horse-play—these have no place at the fair.

► Names and addresses of visitors and their companies should be obtained by "Guest Registration," catalog request cards, give-away attractions, and other schemes.

► Publicity or press kits are an asset. Available photos and releases help to give your products wider promotion when tied-in with fair exhibits. ▲



These exhibits were viewed by visitors to the Metropolitan Miami Garden Show last year. At left, George C. Butler, sales representative for Armour Fertilizer Works (now named Armour Agricultural Chemical Co.) is shown with their exhibit which won second prize in the commercial category at the show. Collins Chemical received honorary mention for the exhibit below. Kilgore Seed Co. used their exhibit to publicize Gro-Rite, their brand name for fertilizer and other products.



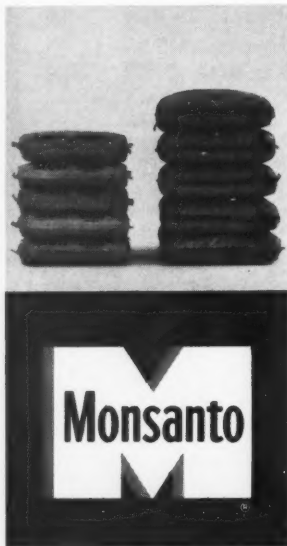
## Why you should take a close look at LION E-2\*

You don't have to look this close to see the advantages of selling Lion E-2 Ammonium Nitrate. The first thing you'll notice is that Lion gives you a definite storage advantage because of its super-density. An 80-lb. bag of Lion E-2 is 20 to 25% smaller than an 80-lb. bag of any other brand. Thus, the storage space you save with Lion E-2 can be used for 20 to 25% larger inventories to make more profit.

You feel the second advantage when you pick up a bag of Lion E-2. The bags are coated with Syton®, a special Monsanto antislip agent that lets you and your customers get a better grip for faster, safer handling.

Lion E-2 gives your customers another big advantage, too. Because Lion E-2 is super-dense, farmers can load more in their spreaders . . . actually eliminate one out of every five refill stops! And, Lion E-2 is guaranteed at least 33.5% vital nitrogen for maximum yields.

If you want the "lion's share" of ammonium nitrate sales in your area, take a close look at Lion E-2. You'll like what you see! Want more information? Just roar! LION E-2, Monsanto Chemical Company, St. Louis 66, Mo. LION: Reg. T. M.; \*E-2: T. M. Monsanto Chemical Co.



LION E-2 is the only ammonium nitrate on the market that can save 20 to 25% of your valuable storage space. Because each Lion E-2 prill contains less useless air, you can stack *five* 80-lb. bags of Lion E-2 in the same space previously taken up by just *four* 80-lb. bags of any other brand. (Lion E-2 is a good deal for your customers, too. Because of E-2's super-density, farmers can eliminate one out of every five refill stops.)

## MATERIALS HANDLING CUSTOM APPLICATION

### PESTICIDE

By T. E. CORLEY\*

**P**HYSIOLOGISTS, entomologists, and pathologists can look with pride at the recent developments in chemicals for pest control and defoliation. The remarkable progress in pest control and defoliation could not have been possible without corresponding progress in application equipment. As we approach another year of pest control and defoliation let's focus our attention on the application equipment problems with particular emphasis on 1960 recommendations.

The most important development of application equipment in recent years has been the low-volume sprayer. This is the one piece of equipment that can be used for all pest control and defoliation work. It is fast becoming a standard piece of equipment on our farms. Yet, many farmers and farm leaders are not familiar with the proper use of the sprayer and its many applications.

The low-volume sprayer is not the only important piece of application equipment. Aerial applicators (dusters and sprayers) certainly play an important role in applying cotton insecticides and defoliants. Also, the tractor duster is still widely used for applying insecticides and defoliants. The granule applicator is now being used to apply insecticides for fire ant and corn borer control. Most of you are familiar with the proper use of this equipment and I am going to spend most of my time discussing the use, calibration, and maintenance of the low-volume sprayer. A more thorough understanding of the versatility and correct usage of the low-volume sprayer will increase farmer acceptance of this equipment. This, in turn, will mean a much wider acceptance and use of pest control and defoliation recommendations.

The basic elements of a sprayer (pump, strainers, hoses, pressure regulator and gauge, and tank) may be used for many jobs. Nozzle types, sizes, arrangements, and methods of mounting vary with the spraying job. The objective of any spraying job must be known before a nozzle arrangement can be recom-

mended. The following are not the only approved recommendations but they do represent a summarization of proven practices.

#### DISEASE CONTROL

In applying fungicides to control cotton seedling diseases, the objective is to treat the soil through which the seedling will grow. This means that the chemical must be mixed with the soil from the seed level to the soil surface in a band  $\frac{3}{4}$  to 2 inches wide. (Note: This is in addition to pre-planting seed treatment).

##### 1960 recommendation

NOZZLE TYPE: Hollow cone or fan

PRESSURE: 35 to 60 PSI

NUMBER OF NOZZLES: 2 per row

ARRANGEMENT: One nozzle spraying directly on the seed in the furrow. The other nozzle spraying the soil as it is thrown into the seed furrow.

APPLICATION RATE: 10 to 16 gallons per acre

#### PRE-EMERGENCE WEED CONTROL

The objective in applying chemicals for pre-emergence weed control is to treat the soil surface, usually a band treatment.

##### 1960 recommendation

NOZZLE TYPE: Even-pattern fan

PRESSURE: 20 to 60 PSI

NUMBER OF NOZZLES: 1 per row

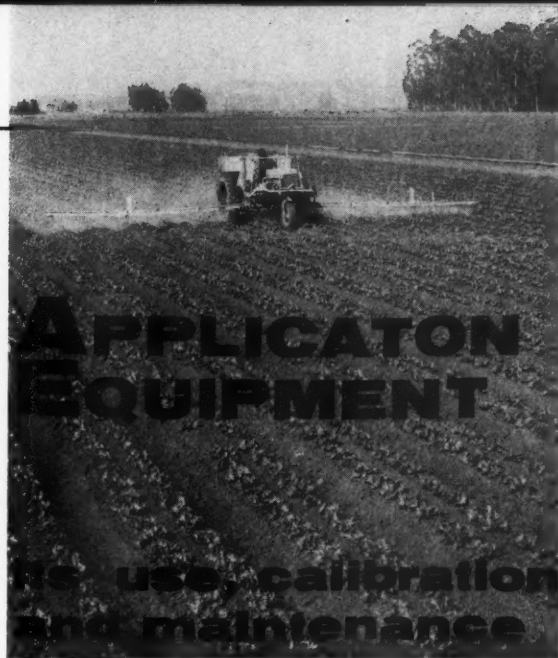
ARRANGEMENT: The nozzle should be supported by a bracket centered over the row directly behind the planter press wheel. The nozzle should be mounted at a height above the ground to spray a band 12 to 14 inches wide.

APPLICATION RATE: 7 to 14 gallons per acre

SPECIAL EQUIPMENT: No special equipment is necessary for pre-emergence treatment, but a wide, solid press wheel leaves the row surface in better condition for more effective post-emergence treatment of cotton.

#### POST-EMERGENCE WEED CONTROL

For cotton, the objective is to apply herbicidal oil to give thorough coverage of weeds in the row without



\* Associate Agricultural Engineer, Auburn University Agricultural Experiment Station and USDA. Presented at the Alabama Pest Control Conference, February 17-18, 1960.



## MATERIALS HANDLING CUSTOM APPLICATION

getting oil on the cotton leaves.

### 1960 recommendation

NOZZLE TYPE: Fan (even-pattern or light-edge)  
PRESSURE: 20 to 40 PSI

NUMBER OF NOZZLES: 2 per row

ARRANGEMENT: One nozzle mounted on each side of the row about 1 inch above the ground surface and directed so that the spray covers an 8- to 10-inch band on the row and hits only the bottom inch of the cotton stalk.

SPECIAL EQUIPMENT: Special spray shoes or shields are necessary to support the nozzles at a uniform height.

For corn, the objective is to apply spray directly on weeds and not on terminal growth of corn. The nozzle arrangement is the same as the arrangement for lay-by weed control (see below) except that the nozzles should be directed to cover the weeds instead of the ground surface.

For pastures, the objective is to apply spray directly on weeds.

### 1960 recommendation

NOZZLE TYPE: Fan or broadcast

PRESSURE: 20 to 60 PSI

NOZZLE ARRANGEMENT: 1 broadcast nozzle 36 inches above the weeds and spraying a 25- to 50-foot swath or

fan nozzles spaced 18 to 22 inches on a boom 18 to 20 inches above the weeds and spraying a swath width equal to boom length.

APPLICATION RATE: 10 to 25 gallons per acre

### COTTON LAY-BY WEED CONTROL

The objective is to treat the entire soil surface. The chemical should be applied after the last cultivation and the row and middle should be free of weeds.

### 1960 recommendation

NOZZLE TYPE: Fan (even-pattern or light-edge) or flooding

PRESSURE: 20 to 60 PSI

NUMBER OF NOZZLES: 1 or 2 per middle

ARRANGEMENT: Nozzle, or nozzles, should be suspended in the middle between rows, placed close to the ground, and directed to cover the entire ground surface.

APPLICATION RATE: 10 to 15 gallons per acre

SPECIAL EQUIPMENT: Flexible boom drops to support nozzles in middle between rows.

### INSECT CONTROL

In applying cotton insecticides, the objective is to get thorough coverage of the terminal growth. A fine spray with small droplets is desirable.

### 1960 recommendation

NOZZLE TYPE: Cone or fan (most states specify cone nozzles)

PRESSURE: 30 to 80 PSI

NUMBER OF NOZZLES: 1 to 3 per row depending on plant size and nozzle arrangement. Most states recommend 3 nozzles per row for cotton more than 2 feet tall.

ARRANGEMENT: When 3 nozzles per row are used, 1 nozzle should be directly over the plants and 1 on each side 6 to 10 inches below the overhead boom. All nozzles should be 6 to 12 inches away from the cotton plants.

APPLICATION RATE: 6 to 10 gallons per acre

For the corn borer, the objective is to get the spray into the whorls. Use the same nozzle arrangement as recommended for cotton but increase the application rate to about 20 gallons per acre.

For the corn earworm (on sweet corn) the objective is to spray the silks and ears.

### 1960 recommendation

NOZZLE TYPE: Fan

PRESSURE: 150 to 200 PSI (Note: most low-volume sprayers will not develop sufficient pressure. A high pressure sprayer with a piston pump will be needed.)

NUMBER OF NOZZLES: 4 per row

ARRANGEMENT: 2 nozzles on each side of the row spaced 12 inches apart vertically and directed into the ear zone to cover 24" vertically.

APPLICATION RATE: 20 to 25 gallons per acre

SPECIAL EQUIPMENT: Flexible boom drops to support nozzles in middle between rows.

### DEFOLIATION

In the application of defoliant and desiccants, the objective is to spray each leaf with the correct amount

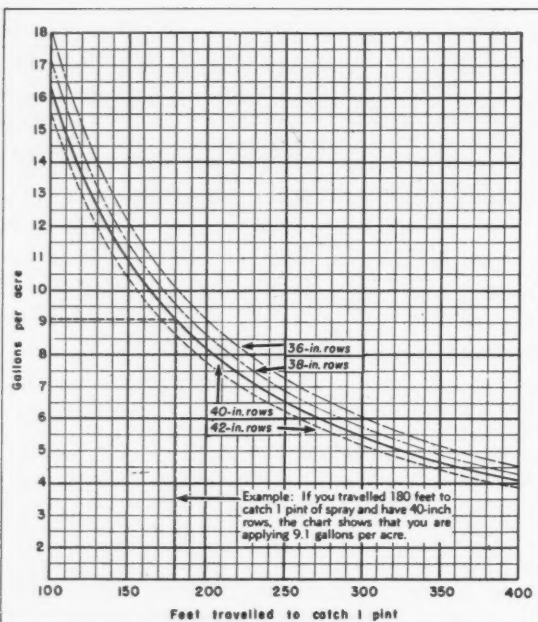


FIGURE 3. Instructions for using the above chart to calibrate row-crop sprayers are given below:

1. Use a pint jar (16 ounces) to catch spray from a nozzle.
  2. Put tractor in field in operating position.
  3. With water in sprayer and throttle set at operating speed, adjust pressure between 30 and 40 pounds.
  4. Put tractor in operating gear with throttle set at operating speed.
  5. Mark starting point and start moving about 20 feet behind starting point.
  6. Put pint jar under nozzle when you cross starting point and continue in field until jar is full.
  7. Measure the distance travelled to fill jar.
  8. Read chart according to the following instructions:
    - a. Move across bottom scale to distance travelled to catch 1 pint.
    - b. Move up to curve of row width.
    - c. Move across to vertical scale and read gallons per acre. This is the number of gallons applied per acre with one nozzle per row. If you have more than one nozzle per row, multiply the gallons by the number of nozzles per row to get gallons per acre.
- Note: If you must travel more than 400 feet to catch a pint, use a half-pint jar (8 ounces) and the volume of spray will be one-half of that shown on the chart.

# ELEMENTARY...NOT A

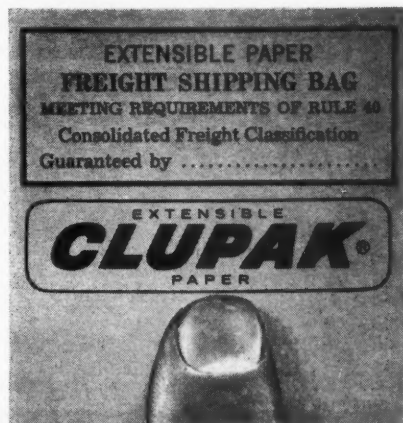


# BAG!



New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all and multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid toughness specifications established by Clupak, Inc. for your benefit.



\*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.



*Adding up the values of IMC's*

# HERE'S WHAT IT

Over the last eighteen months IMC's *Total Service* has helped hundreds of fertilizer manufacturers sell more fertilizer profitably. It is called *Total Service* because it serves every phase of your fertilizer business. Reviewing this past year, here are the benefits that Total Service offered you—as a customer of IMC.

## **SELLING SERVICES —**

The Planalyzer is a good example. Here was a twelve-month sales calendar that channeled responsibility and due dates for an orderly completion of the total sales activity. More help is yours in terms of "how to" manuals on Market Analysis, Sales Manpower, Promotion, Transportation, Technical Service; a complete kit on Farmer Meeting methods.

## **MANAGEMENT HELP —**

in setting up insurance and safety programs; establishing credit and collection systems . . . with detailed manuals to help keep the programs current and aggressive. IMC executives have consulted with many manufacturers at Skokie on a wide range of management prob-

lems and offer this same service to you.

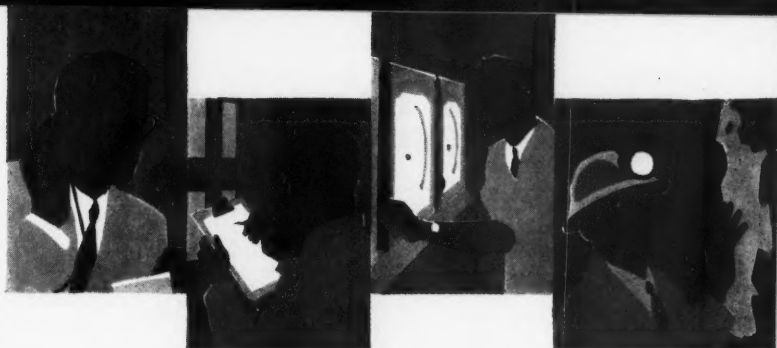
## **CUSTOMER SALES TRAINING —**

Last year we held 20 two-day meetings in cities across the country . . . to present sales ideas and techniques to customer salesmen. 849 men attended — company presidents, sales management, sales staff members. IMC sales executives are prepared to bring sales assistance of this kind directly to your plant.

## **TECHNICAL SERVICE —**

is offered on a regularly scheduled, planned basis and embraces your total manufacturing operation. It is a preventive service — symbolized by IMC's Preventive Maintenance Checklist. We're on call for emergency techni-

## **TOTAL SERVICE**



# **T DOES FOR YOU**

cal help, too. And all of the technical people involved know the fertilizer business from product mine to finished goods.

### **TRANSPORTATION SERVICE —**

We maintain the industry's largest transportation personnel staff — to serve you in all areas. This applies whether it is products you buy from us or finished goods you sell your customers . . . whether the ingredient or fertilizer moves by rail, truck, barge or vessel. The "extras" include just about every phase of transportation . . . from loading methods to complex freight rate problems.

### **MOST COMPLETE LINE OF FERTILIZER MATERIALS —**

All IMC services are keyed to a full product

line . . . one source that combines product and service into a major contract benefit. It means more skillful representation . . . on a frequent routine. It means conveniences for you in purchasing, in contact time, in scheduling, in handling materials at storage points.

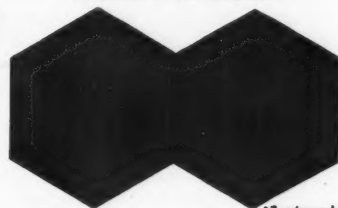
#### **Products and Services from IMC**

- Phosphate Rock
- Triple Superphosphate (Coarse, Granular, Run-of-pile)
- Phosphoric Acid
- Muriate of Potash (Coarse, Standard, Granular)
- Sulphate of Potash
- Sul-Po-Mag

Manufacturing and Technical Service  
Transportation Service  
Customer Service  
Management Service  
Marketing Services

*A contract with IMC is our pledge of TOTAL SERVICE. If you have not already availed yourself of all these services, we invite you to do so.*

Products for Growth\*



\*Trademark

AGRICULTURAL CHEMICALS DIVISION

**INTERNATIONAL MINERALS & CHEMICAL CORPORATION**

Administrative Center: Skokie, Illinois



## MATERIALS HANDLING CUSTOM APPLICATION

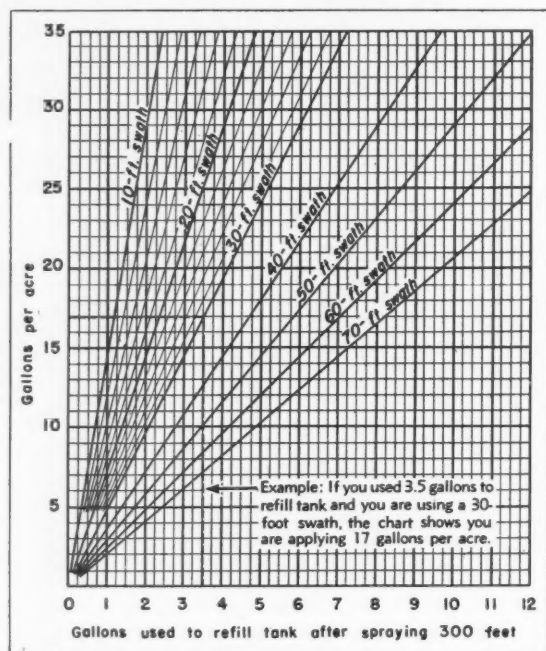


FIGURE 2. Instructions for using the above chart to calibrate a broadcast sprayer (boom or boomless) are given below:

1. Measure a 300-foot distance in field to be sprayed or in an area with surface similar to that in field.
2. With water in sprayer and throttle set at operating speed, operate sprayer and adjust pressure to the desired setting (10 to 60 pounds).
3. Fill tank completely full or to a mark on gauge stick.
4. Put tractor in operating gear with throttle set at operating speed and operate sprayer over the 300-foot distance.
5. Measure to the nearest quart the amount of water required to fill tank to the original level.
6. Read chart according to the following instructions:
  - a. Move across bottom scale to gallons used to refill tank.
  - b. Move up to the line of your swath width.
  - c. Move left to the vertical scale and read gallons per acre.

of chemical. Improper nozzle size and arrangement often result in too much chemical on the top and outer leaves and not enough on the bottom leaves. Nozzles that produce a coarse spray with large droplets should be used to get better penetration and more uniform coverage.

### 1960 recommendation

**NOZZLE TYPE:** Fan, flooding, or broadcast  
**PRESSURE:** 20 to 50 PSI

**NUMBER OF NOZZLES:** 1 to 7 per row depending upon plant size and nozzle type and arrangement. For cotton less than 5 feet in height with normal foliage, 1 flooding nozzle per row or 3 to 5 fan nozzles per row, or 1 broadcast nozzle per 8 to 10 rows will give satisfactory coverage. For unusually rank growth, 1 or 2 additional nozzles should be used in the row middle.

**ARRANGEMENT:** 1 flooding nozzle 12 to 18 inches above the plants in each row and spraying downward and backward at a 45° angle for cotton less than 5 feet in height. Add 1 or 2 flooding nozzles behind a shield in each middle for unusually rank cotton

or

1 broadcast nozzle 36 inches above the plants for every 8 to 10 rows for cotton less than 5 feet in height or

1 to 2 fan nozzles above each row plus 1 to 3 fan nozzles on each side of the row.

**APPLICATION RATE:** 12 to 30 gallons per acre

### CALIBRATION

It is important to know how much spray the sprayer is applying. Proper amounts of chemicals that should be applied for best results have been determined and the sprayer should be adjusted and operated to apply these recommended rates. Too much spray may cause injury and is a costly waste, and too little spray will not do the job.

Calibrating or determining the amount of solution the sprayer is applying can be done by collecting and measuring the solution from a nozzle while operating the sprayer over a measured distance. The volume of spray applied per acre can then be calculated. To avoid complicated calculations, the accompanying charts may be used according to the instructions to determine rate of spray. (For complete details on sprayer calibration write for Alabama Experiment Station Circular 126).

If the desired amount of solution is not being applied, changes must be made and the sprayer must be calibrated again. The best way to make small changes in amount of spray is to change the pressure. The best way to make a large volume change is to vary the size of nozzle orifice or opening by changing nozzle tips.

Once the sprayer is calibrated, the following precautions must still be taken to make sure that the correct amount of chemical is applied:

1. Mix the chemical in clean water and in the correct proportions.
2. Apply chemical at same pressure and tractor speed as used for calibration.
3. Keep nozzle screens and openings clean by making frequent inspections and cleaning as needed.
4. Keep solution thoroughly agitated while applying.

### OPERATION AND CARE OF SPRAYERS

#### Beginning of Season Care

1. The sprayer mounting frame should be fastened securely and braced properly to the tractor.
2. All pipe and hose connections should be leak-proof.
3. Make sure that pump can be turned by hand before mounting it on the tractor PTO. (Note: If pump cannot be turned by hand, it should be disassembled and freed according to instructions furnished with pump.)
4. Do not pound or hammer the pump to get it on the tractor PTO. If the PTO shaft and the pump coupling are clean and free of rust, the pump should slip on easily.
5. Secure pump to PTO by means of set screws and anchor pump to sprayer or tractor with chain or chains.
6. Inspect tank and make sure it is clean before mounting.
7. Flush boom with water before attaching the nozzles.

(Continued on page 48)




Owens-Illinois, through years of experience, *thinks in packaging terms* in glass and plastic containers, corrugated boxes, closures and multiwall bags.

## It pays to buy bags from a packaging specialist

PACKAGING EXPERIENCE assures you of the proper design of the multiwall bag to fit its specific uses, dependability of service to give you the right bag, when and where you need it, and, of course, the finest quality.

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## CUSTOM APPLICATION MATERIALS HANDLING

# Spraying by 'copter



**Top:** Two million cubic feet of air per minute drive spray down, around and even back up to envelop bolls and foliage. Individual nozzles not needed can be turned off to coincide with skip row rotational planting.

**Center:** Back for more. Here the Hiller ship "pulls up" for a tank load. The 1,000 gallon nurse rig is supplied by WhirlWide. It keeps solution in constant agitation for fieldwide homogeneity.

**Bottom:** Two of WhirlWide's helicopters ready to start another job. Hiller 12E in the foreground is reported to be the most powerful in its class.

**P**ROFITABLE cotton production and horsepower are related. It was proved when a new light utility helicopter treated cotton in California's San Joaquin Valley recently.

The helicopter, a 305 horsepower Hiller 12 E, is one of several owned and operated by WhirlWide Helicopters, Inc., Fresno, Calif.

Just how increased horsepower affects the application of agricultural chemicals was explained by Ron Smith, general manager of the charter helicopter operation.

"It isn't increased speed, as in fixed wing, that makes the big difference. Just the opposite.

"In this Hiller we maintain a constant air speed of only 30 miles per hour, less than half the stall speed of fixed wing spray planes.

"The 12 E's power advantage in this case means we can match payloads with fixed wing and add the benefits of a two million cubic foot per minute downwash," Smith explained.

### TWO TREATMENTS FOR DEFOLIATION

In cotton defoliation, for the first treatment, the helicopter takes off from the edge of the field—or anywhere the nurse rig can go—loaded with 125 or more gallons of magnesium chlorate solution.

Experience already garnered with the 12E has shown that its single, low level, downwash-driven treatment reaches all bolls and foliage.

A week later, on the chlorapenaphenol treatment, the same is true. The copter literally envelops the crop in the creosote-like diesel fuel mixture with a downwind equal to all the air in Madison Square Garden every two minutes.

"After both treatments," Smith concluded, "the crops are ready for the mechanical pickers to go through. There are fewer bollies, and more clean pickings—all from two treatments per crop.

Other crops which have benefited from the WhirlWide special brand of downwash are pears in the steep Sierra foothills near Placerville, Calif., oranges in Orange County, and weed control in valleys along the state's coastal range, and even control of the Lodgepole Needle Miner, a microscopic worm which plagued stands of Lodgepole Pine in the national forest high above Yosemite National Park. ▲

FARM CHEMICALS



# READER SERVICE

*FREE INFORMATION to help you  
solve fertilizer, pesticide problems*

## Chemicals

### 101—OLDBURY SODIUM CHLORATE

Oldbury sodium chlorate is now shipped in an easy opening drum, says Hooker Chemical Corp. A single lever seals and rescals the drum with a metal band. The product sterilizes the soil for one and even two years. Specifications and a bulletin are available. Just

CIRCLE 101 ON SERVICE CARD

### 102—KOLKER'S METHYL BROMIDE

Information on methyl bromide is offered by Kolker Chemical Corp. Packaged in one-pound cans with 2 per cent chloropicrin as warning agent, and 50, 150 and 450 pound cylinders of 100% methyl bromide, the fumigant is reported to kill insects, mites and related pests in all stages of development. For details,

CIRCLE 102 ON SERVICE CARD

### 103—MAGCOBAR CLAY

Literature on granular and pulverized Carriclay and Pulgite, and Arrowhead granulate bentonite is available from Magnet Coyo Barium Corp. To obtain your copy, simply

CIRCLE 103 ON SERVICE CARD

### 104—DDVP SAMPLES

Samples and technical data on DDVP are available from R. W. Greeff & Co., Inc. Among uses of DDVP (dimethyl dichloro vinyl phosphate): in sugar-based fly baits, as a phoracide in mushroom culture and for control of cigarette beetle in tobacco warehouses. For your copy of the data and for samples,

CIRCLE 104 ON SERVICE CARD

### 105—AGRIWET 9086

Data sheets on Agriwet 9086 have been prepared by Nopco Chemical Co. for pesticide formulators. The company says Agriwet 9086 offers rapid and thorough wetting of pesticidal wettable powders. It also is reported to prevent flocculation which occurs when wettable powders are dissolved in hard water or when two or more wettable powders are dispersed in combination in the solution. To get your data sheets,

CIRCLE 105 ON SERVICE CARD

### 106—TERRACLOR

Complete information on Terraclor for control of soil-borne diseases is offered to formulators by Olin Mathieson Chemical Corp. The soil fungicide is available as 75% wettable powder, 2-lb. emulsifiable, and dust formulations. For details, just

CIRCLE 106 ON SERVICE CARD

### 107—FACTS ABOUT PYRETHRUM

A booklet, "Facts About Pyrethrum" is available from Chas. Hurd Associates, information representatives for African Pyrethrum. Containing eight pages, it lists products which contain pyrethrum, advantages, names and addresses of American refiners and other information on pyrethrum. To get a copy

CIRCLE 107 ON SERVICE CARD

### 108—SIMAZINE

Geigy Agricultural Chemicals will send interested custom applicators data on their Simazine herbicide. A pre-emergence herbicide for use on corn, one application of Simazine is reported to give season-long effective weed control. The product also is used as an industrial herbicide. For details,

CIRCLE 108 ON SERVICE CARD

### 109—PYROPHYLLITE

Glendon Insecticide Grade Pyrophyllite is the subject of a four-page brochure from Carolina Pyrophyllite Co. Ground so that 92 to 95 per cent will pass a 325 mesh screen, the product has a pH range of 6 to 7, is non-hygroscopic. A copy of the brochure will be mailed to you, if you

CIRCLE 109 ON SERVICE CARD

### 110—FERRO F.T.E.

Six minor elements are combined in FTE (fritted trace elements), according to Ferro Corp.—boron, iron, manganese, zinc, copper and molybdenum. And as little as 1% to 1½% FTE in mixed fertilizers has proven effective, Ferro says. An eight-page booklet available from the manufacturer provides additional information. You can obtain a copy by

CIRCLING 110 ON SERVICE CARD

### 111—INSECTICIDE GUIDE

A compact guide on Thiodan insecticide has been published by Niagara Chemical Div. of Food Machinery and Chemical Corp. The guide features an easy-to-read chart on how to use Thiodan. Suggested amounts for control of specific pests, time of application and other perti-

nent data are listed by individual crop. Also described are general properties, compatibility, various formulations now available. You can obtain a copy by

CIRCLING 111 ON SERVICE CARD

### 112—MONAWET LITERATURE

A widened line of sulfo succinates is described in a revised pamphlet covering Monawet surfactants, issued by Mona Industries, Inc. Technical grades of the new powdered Monawets are especially attractive for compounding of pesticides and fertilizers, where speedy wetting, spreading and penetration are of great importance, the manufacturer says. Obtain your copy by

CIRCLING 112 ON SERVICE CARD

### 113—INSECTS IN STORED GRAINS

A ten-page booklet entitled "Better Control of Insects in Stored Grains" has been published by Stauffer Chemical Co. Among the subjects discussed are grain protectants, fumigants and sanitation methods. One feature of the booklet is a handy wall chart which includes identifying sketches of principal stored grain insects. Copies are available without charge.

CIRCLE 113 ON SERVICE CARD

### 114—SOHIO UREA

Sohio Chemical Co. suggests that you fill out your fertilizer line with Sohio Urea. It delivers 45 per cent actual nitrogen, is prilled, free-flowing and easy to apply, Sohio reports. Information on the product is readily available. Just

CIRCLE 114 ON SERVICE CARD

### 115—DICALITE BULLETIN

"Dicalite Mineral Fillers" is the subject of a 12-page booklet from Dicalite Dept., Great Lakes Carbon Corp. After answering the question, "What is Diatomite," the booklet discusses chemical properties, density and bulking effects, particle structure, surface area, porosity and absorptiveness, heat conductivity and heat resistance and other characteristics. In a section on applications of Dicalite, the booklet describes use in fertilizers and insecticides. To secure a copy, simply

CIRCLE 115 ON SERVICE CARD

## Process Equipment

### 116—McDERMOTT COOLERS & DRYERS

A free 12-page booklet published by McDermott Brothers Co., Inc., includes dia-

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- Clip and mail the Service Card



*See pages 57 and 58 for information  
on these Reader Service numbers:*

- 131—Thermoplastic Tape-Top Bag Closing Machine
- 132—Pressure Relief Valve with Diaphragm Design
- 133—Hough's New H-30 Payloader with 4-Wheel Design

grams, descriptions and on-the-job photographs. The company designs and builds drying and cooling equipment. For your copy of the free booklet

CIRCLE 116 ON SERVICE CARD

#### **117—GRANULAR FERTILIZER PROCESSING EQUIPMENT**

A 12-page, two-color bulletin, "Renneburg Continuous Granular Fertilizer Processing Equipment" has been published by Edw. Renneburg & Sons Co., and is available to readers. It pictures and describes the continuous combination ammoniator-granulator, dryer furnaces, dryers, coolers, air handling systems and pilot plant equipment. To obtain a copy

CIRCLE 117 ON SERVICE CARD

#### **118—PLIBRICO CATALOG**

Profusely illustrated, Plibrico Co.'s new 24-page book gives data on drying, calcining and processing. Plibrico linings are one-piece, have no joints to cause needless maintenance, the book points out. Among the installations pictured are Plibrico-lined dryer furnaces of a granulated fertilizer producer and a phosphate processor. The literature covers tail rings, furnace doors, clinker coolers, dust chambers, waste heat boilers, stacks and breechings, dryer furnaces and gypsum kettles. A free copy will be yours, just by

CIRCLE 118 ON SERVICE CARD

#### **119—TURBULAIRE-DOYLE SCRUBBER**

A four-page, two-color bulletin from Western Precipitation Corp. describes the Turbulaire-Doyle Scrubber. Among its applications is in cooling and humidifying gases from fertilizer, acid and reclaiming operations. A dimension sheet appears in the bulletin, along with information on the "jet-action" principle and power requirements. If you'd like a copy,

CIRCLE 119 ON SERVICE CARD

#### **120—DUSTLUBE FIELD REPORT**

A field report from Wheelabrator Corp. describes use of Dustlube collectors in a mixed granular fertilizer plant. The collectors were used to ventilate the dryer, bulk loading and packaging stations. The problem, its solution, results and conclusion are given. To get a free copy,

CIRCLE 120 ON SERVICE CARD

#### **121—PULVER-MILL**

Designed for application in DDT, other chemical and process industries, the Pulver-Mill offers double-hammer grinding and deflector wall construction, according to its maker, Sturtevant Mill Co. It is a vertical hammer mill with integral air classifier for fine grinding. Full informa-

tion on the unit is contained in a bulletin, available by

CIRCLE 121 ON SERVICE CARD

## **Materials Handling**

#### **122—JETSINGERS**

"Jetslingers," a six-page folder, describes the three types of Link-Belt Co. Jetslingers. They are machines equipped with short, high-speed belt conveyors for hurling free-flowing bulk materials into areas inaccessible by other mechanical means. The folder describes and illustrates both the suspended, swiveling and wheel-mounted units which are used for hurling material into storage in warehouses, boxcars, holds of ships, bins or upon the ground. For a copy

CIRCLE 122 ON SERVICE CARD

## **Packaging**

#### **123—BAG CLOSING**

George H. Fry Co. reports its Model CSG bag closer is ideal for closing small square or flat paper bags containing insecticides, fertilizers, and other granular products. It double-folds, heat seals and glues on heavy-weight coated or lined paper bags, and the closing operation is continuously automatic. A free brochure is available. Just

CIRCLE 123 ON SERVICE CARD

#### **124—KRAFT-LOK BAGS FOR GRANULAR GOODS**

There are ten good reasons for packaging granulated fertilizer in Kraft-lok bags, according to Kraft Bag Corporation. Among them are elimination of snagging on packer tubes; flexible valve area improves bag handling; filling operations speeded by efficient "venting;" leakage is reduced in closing and sifting is minimized in handling. Additional information is available. Just

CIRCLE 124 ON SERVICE CARD

#### **125—AF BAGPAKER**

International Paper reports that the "AF" Bagpaker weighs, fills, settles and closes a 100-lb. bag every 2½ seconds. Operator hangs empty multiwalls on hopper spouts as the 10-station turret rotates past him, and the packer "takes over" from there. Constructed of heavy welded steel, the AF Bagpaker has fully enclosed gears, and critical parts are of stainless steel. For complete information

CIRCLE 125 ON SERVICE CARD

#### **126—CORRUGATED BOX HAS A SPOUT**

A sift-proof corrugated box with a pouring spout, designed for domestic packaging of granular and powdered materials, has been announced by Continental Can Co. Adaptable to conventional automatic packaging equipment, the box is filled from the bottom or non-pour spout side. Box corners are sealed by knife-cutting the flaps shy of the scores instead of using conventional slots. Projected uses include chemicals, fertilizer, lawn and garden seed. You can have complete information, by

CIRCLE 126 ON SERVICE CARD

## **Application Equipment**

#### **127—PUMPS FOR LIQUID FERTILIZERS**

Eight pump models offered for handling complete mix fertilizer solutions are covered in literature from Gorman Rupp Co. Illustrations, specifications and performance curves are included for liquid mix, aqua ammonia and nitrogen solutions pumps. For your free copy

CIRCLE 127 ON SERVICE CARD

#### **128—CATALOG OF NOZZLES AND ACCESSORIES**

Spraying Systems Co. spray nozzles for farm, ranch, orchard and garden spraying are covered in a new catalog from the company. Included are TeeJet spray nozzles for boom and broadcast spraying of herbicides, insecticides and fertilizers; row crop spraying of insecticides; roadside spraying; flow regulators; fittings; shut-off valves; spray guns; line strainers and suction strainers. For your copy of the 20-page catalog,

CIRCLE 128 ON SERVICE CARD

## **Miscellaneous**

#### **129—PRE-PRINT CONTAINERS**

With its Autoprinter, Industrial Marking Equipment Co. reports you can date, mark or code multiwall bags as you need them. The machine is automatic, electronically controlled and works right with your production line. IME says the Autoprinter can speed your operation, save money. Details are contained in a catalog, yours by

CIRCLE 129 ON SERVICE CARD

#### **130—SERVICES & PRODUCTS CATALOG**

"General American Services & Products for the Process Industries" is the title of a 20-page catalog from General American Transportation Corp. It describes and pictures GATX tank cars, Airslide cars, Dry-Flo Cars, custom fabrication, field erection, tank storage terminals, mixing devices and Louisville dryers. The section on dryers contains a selector table which lists a variety of materials, including DDT, diammonium phosphate, fertilizers, phosphates, potash, and 2,4-D powder. For your copy just

CIRCLE 130 ON SERVICE CARD

FARM CHEMICALS



Electron micrographs showing plate-like Micro-Cel E and spherical Micro-Cel B structures.

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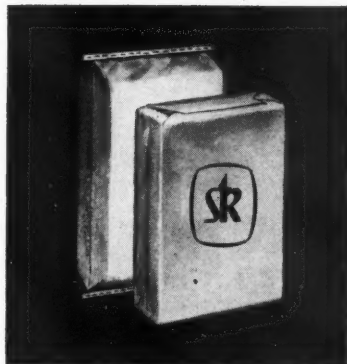
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APRIL, 1960

45

# PEST REPORTS

By Kelvin Dorward\*

**I**NSECT activity during February continued to be rather restricted. **Aphids** were active in several states with the **greenbug** on the increase and becoming more common in south central Oklahoma where counts ranged from 4-80 per linear foot with the average being 23. In some areas of the state there was some decrease from previous weeks.

Greenbug populations were on the increase in Louisiana, particularly in the northwestern area. Counts ranged from 0 to more than 1,000 per linear foot of oats in fields in Claiborne, Ouachita, Red River and Natchitoches parishes. Predators were not present in any of the fields surveyed and the number of parasitized aphids was negligible. There was a slight increase of the greenbug in Arkansas. Counts ranged 3-15, averaging 9, per linear foot in Washington and Benton counties.

In Texas infestations were found

only in isolated areas and very little damage had been noted by the latter part of February. Greenbug counts in Kansas were very low. One wheat field surveyed in Marion county, Kansas, had less than one greenbug per square foot.

During February the **pea aphid** increased slightly in Yuma county, Arizona, alfalfa with counts averaging 10-25 aphids per 10 sweeps. Light to moderately heavy populations were present in Chaves, Eddy and Lea counties, New Mexico. Very light populations were showing on alfalfa in the El Centro area of Imperial county, California. The pea aphid, in light numbers, was found generally distributed in Oklahoma. The highest count recorded was 32 aphids per square foot of alfalfa crown area in a field in Choctaw county. In Kansas counts averaged less than one aphid per square foot in a Marion county alfalfa field.

The **spotted alfalfa aphid** was light in all states reporting on the insect during February. There was a slight buildup in southern New Mexico counties, but by the end of the month this had been checked. California, Arizona, Texas, and Oklahoma reported the pest present but only in limited areas.

The first report of the season for the **alfalfa weevil** in North Carolina was received the latter part of February. Larvae, some about half grown and averaging 2-3 per terminal, were reported from Richmond county.

Among the vegetable insects the **cabbage looper** continued to be of concern on lettuce and cabbage in the lower Rio Grande Valley of Texas with a considerable amount of control being applied, particularly in the Starr county area.

In mid-March heavy infestations of the **vegetable weevil** on turnips were reported from Wheeler county, Georgia. A **thrips** heavily infested seedling onions throughout most of the Mesilla Valley,

New Mexico, and heavy populations of the **strawberry aphid** were present on strawberries in El Cajon, San Diego county, California.

A **leaf roller** was also heavy on strawberries in the same California area. At Downey, Los Angeles county, an **aphid** was severe on strawberries in a localized area.

The annual survey to determine the population of the **beet leafhopper** present in the far southern desert-breeding areas was conducted during February. The insect is the carrier of the virus which causes curly top in sugar beets and tomatoes. Beet leafhopper movement is expected to be light this spring. This observation is based on conditions found on the survey, but weather conditions during March and April will have a definite effect on the amount of the leafhopper population that moves from the desert areas to cultivated districts. Movement of the leafhopper into the cultivated areas of central and southern Arizona and southeastern California was expected to occur in late February or early March. The movement to southern Nevada and Utah is expected to take place during late March and early April and to central Utah and western Colorado during late April.

**Bark beetles** were causing complete kills of ponderosa pine in small groups on private lands in the Omo Ranch—Somerset—Fairplay area of El Dorado county, California. These beetles were also responsible for kill to small groups of ponderosa pine trees in the Placerville and Westfall-Miami, California, areas. A reproduction weevil was responsible for causing complete kill of 5 to 6-year-old ponderosa pine seedlings on a ranch near Georgetown, El Dorado county.

Wet weather hampered efforts to apply control to **southern pine beetle** infested trees in Hardin and Liberty counties, Texas. Controls were applied to two small spots but 31 spot infestations were not treated. ▲

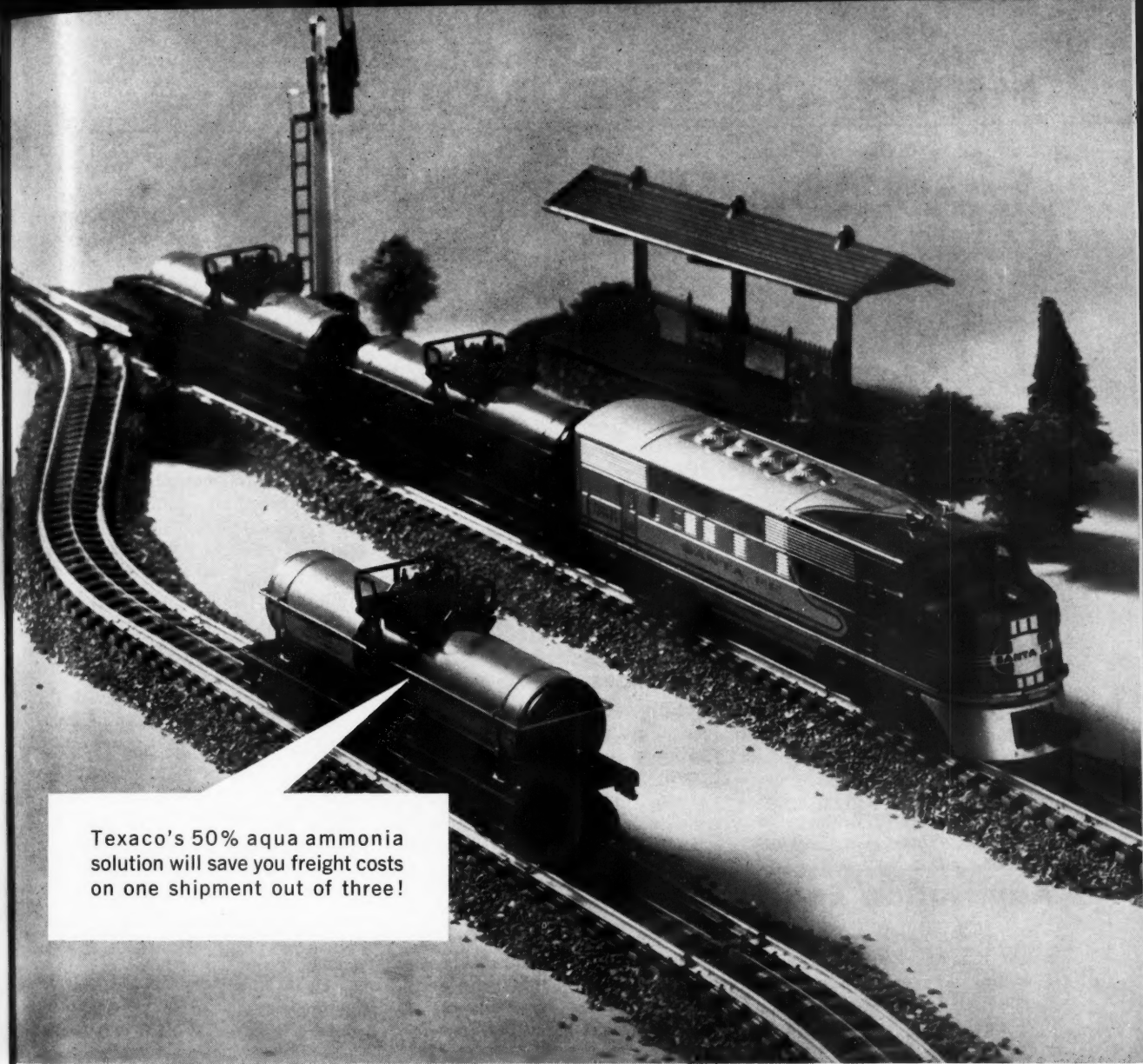
\* Chief Staff Officer, Survey & Detection Operations, Plant Pest Control Div., Agricultural Research Service, USDA.



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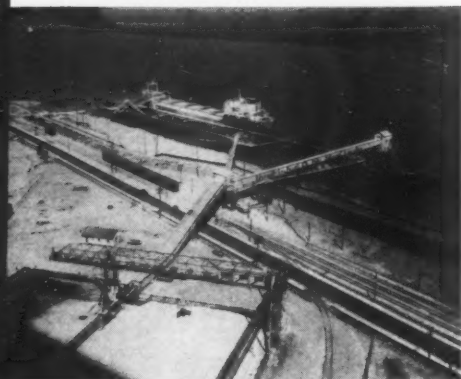
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# NEWS OF THE INDUSTRY

## SULPHUR EXPORT CORP. MAKES RECORD SHIPMENT



The H. L. Lorentzen is loaded at Port Sulphur, La. The loader is a unique traveling machine which can be moved from hold to hold in five minutes. Both loader and  $\frac{3}{4}$  mile belt conveyor system are controlled by a single portable panel of push buttons.

Sulphur Export Corp., overseas sales agency for major United States sulfur producers, has announced completion of loading of the largest single sulfur shipment ever made. The sulfur is destined for Rotterdam and Hamburg.

A record 20,900 long tons of 99.98

per cent pure bulk sulfur were loaded on board the new Norwegian vessel H. L. Lorentzen by Freeport Sulphur Co. at Port Sulphur, La., on the lower Mississippi River.

## COLUMBIA-SOUTHERN INCREASES PRICES

Columbia-Southern Chemical Corp. has announced price increases of \$2 a ton on liquid chlorine; \$2.50 a ton on soda ash; \$2 a ton on high-test flake calcium chloride; and \$1 a ton on regular flake calcium chloride.

A company spokesman said that the increase was made to cover constantly increasing labor costs and higher fuel and raw material costs.

## FMC DROPS WESTVACO NAME

Effective April 1, Food Machinery and Chemical Corp. dropped the name Westvaco from its divisional and brand identifications. The former Westvaco Divisions will in future be known as the Chlor-Alkali and Mineral Pro-

ducts Divisions of the corporation.

Frederick A. Gilbert, FMC vice president and general manager of the Inorganic Chemicals Dept., said that the change has been made to point up the fact that the Chlor-Alkali and Mineral Products lines are part of the broad family of FMC Chemicals.

## PENN-OLIN: JOINT VENTURE OF PENNSALT, OLIN MATH.

Penn-Olin Chemical Co. now is being formed as a joint subsidiary of Pennsalt Chemicals Corp. and Olin Mathieson Chemical Corp., according to Pennsalt president William P. Drake and Olin Mathieson president Stanley de J. Osborne.

A \$6.5 million venture, the subsidiary has been organized to produce sodium chlorate and other chlorate compounds, and will be owned equally by the two corporations. Construction is expected to begin shortly on a 25,000-ton-a-year plant at Calvert City, Ky.

## Application Equipment (Continued from page 38)

8. Inspect nozzle screens and tips for cleanliness and to make certain all tips are of the same size.

9. Run sprayer to check for leaks and to observe nozzle patterns. Irregular shaped nozzle patterns may be detected by observation and must be corrected. They are usually caused by trash or dirt in and around the nozzle orifice or by a clogged nozzle screen. Do not probe the nozzle orifice with a knife blade or other metal objects. Use a tooth brush or soft wood to clean the orifice.

10. Calibrate sprayer and mark throttle setting and record gear position.

11. Calculate the ratio of concentrate chemical and water and record mixing instructions on tank or other convenient place.

### Field Operation

1. It is of utmost importance to always use a clean spray solution.

2. Operate tractor in the same gear and at the same throttle setting as used for calibration.

3. Observe nozzle patterns continuously to detect clogged nozzles and to tell when tank is empty.

4. Do not operate pump when tank is empty. Gear and roller pumps can be seriously damaged by operating dry only a few minutes.

### Daily Care

1. At the end of a day's spraying, flush system with clean water.

2. Check suction and line strainers and nozzle tips and screens and clean if necessary. Clean tips and screens by soaking in gasoline and brushing with a small brush or use compressed air.

### End of Season Care

1. Flush system thoroughly with clean water and then run a few gallons of fuel oil through sprayer to help prevent rust.

2. Remove and clean nozzles.

3. Remove and drain pump. Before storing, gear and piston pumps should be filled with oil and roller and diaphragm pumps should be flushed with a rust inhibitor. All openings in the pumps should be plugged.

4. Applying a coating of oil to the inside surface of steel tanks.

5. Store sprayer under a shed.

### CAUTION ABOUT USING 2,4-D AND 2,4,5-T

A sprayer that has been used to apply 2,4-D or 2,4,5-T should not be used for applying insecticides or fungicides to broadleaf plants such as cotton, soybeans, and vegetables. Even if the sprayer has been thoroughly flushed with clean water, there is likely to be enough 2,4-D or 2,4,5-T left to damage sensitive crops. However, the sprayer may be used to spray livestock. Do not spray 2,4-D or 2,4,5-T near sensitive plants, especially when the wind is blowing toward the plants. To reduce drift, use a low pressure and a large nozzle orifice to produce large droplets. ▲

## OLIN NET SALES AND INCOME INCREASE IN '59

Consolidated net sales of Olin Mathieson Chemical Corp. totaled \$702,032,000 in 1959, an increase of 17 per cent over the 1958 total of \$601,398,000. Net profits amounted to \$37,416,000 or \$2.81 a share, compared with 70 cents a share in 1958 when heavy non-recurring write-offs sharply reduced the year's income.

Sales of the Chemicals Div., \$207.2 million, represented 31.1 per cent of the company's overall sales.

## MONSANTO TO MAKE 105% PHOSPHORIC ACID

Monsanto Chemical Co.'s Inorganic Chemicals Div. is constructing a plant to manufacture 105 per cent phosphoric acid, E. J. Bock, assistant division manager, has announced.

Erection of the plant at Addyston, Ohio (in the Cincinnati metropolitan area), will make Monsanto the nation's first commercial pro-

ducer and shipper of bulk quantities of this concentrated acid, Bock said.

The acid, transported in tank car and tank truck quantities, is easily handled at normal usage temperatures; in addition, the high concentration results in both shipping and handling economies, according to A. Q. Svoboda, product sales manager for the division.

Called Phospholeum by Monsanto, the acid is a natural desiccant.

Although the concentrated acid can be readily diluted to regular acid strength, Monsanto also will manufacture both 75 per cent and 85 per cent acid at the new plant, which is scheduled to go on stream in early September, Svoboda said.

## V-C ANNOUNCES EMPLOYEE RETIREMENT PLAN

A non-contributory retirement plan for its 3400 employees has been announced by Virginia-Carolina Chemical Corp.

Effective July 1, the plan pro-

vides retirement allowances for all employees who are 65 and have 15 years of service, or are over 55 with 20 years of service. The company will pay the entire cost of the benefits.

## ELI LILLY FORMS NEW COMPANY

Eli Lilly and Co. has announced formation of the Elanco Products Co. to market items in the fields of agriculture, industry and home use.

George L. Varnes has been named



Varnes

president of Elanco, which will operate as a division of Eli Lilly & Co. Varnes was formerly executive director of the Lilly Agricultural and Industrial Products Div.

At present, Elanco will merchandise and market products which result from Lilly agricultural and industrial applications research.



Mr. and Mrs. Lewis Johnson. He is with Tri-State Fertilizer.



John Zigler, IMC; William Porterfield, Freeport Sulphur Company; Gene Van Deren, Blue Grass Plant Foods.

J. M. Malk, IMC; Miss Full Orbit; Vincent Squazzo, FARM CHEMICALS.



# OL' TIME HOSPITALITY

THE TURN of the century era was the theme for International Minerals & Chemical Corporation's hospitality suite display at the recent Midwest meeting sponsored by the National Plant Food Institute at Chicago's Edgewater Beach Hotel. There were souvenir bowlers for the men and flapper head bands and beads for the women. Display and entertainers in early-century costumes pointed up IMC's celebration of its 50th anniversary year.



W. J. Klossner, Swift & Co.; Cecil Fluty, Farm Belt Fert. & Chem.; Sinclair McCoy, and Richard Powell, IMC; and Ralph Fraser, Summers Fertilizer Co.

James Totman, Summers Fertilizer Co., and George Urbanis, of IMC.



Robert Yates and Jack Jacobs, Ark-Mo Plant Food Company.



## NEWS OF THE INDUSTRY

### SOLAR NITROGEN EXPANDS LIMA, OHIO, FACILITIES

Edward F. Morrill, president of Solar Nitrogen Chemicals, Inc., reports that the company has undertaken a two million dollar expansion of the ammonia, urea, nitric acid, and nitrate facilities at its Lima, Ohio plant.

Morrill stated that this expansion, resulting in an annual increase in ammonia production of approximately twenty-five thousand tons per year, is moving ahead rapidly and completion is anticipated during 1960.

Solar's production facilities are being expanded to better serve the rapidly growing needs for ammonia, urea, and nitrogen solutions in the Mid-West.

The company's products are sold by the Sohio Chemical Company, manufacturing and sales agent for

Solar Nitrogen Chemicals, Inc., to more than twelve major industries, among which the fertilizer and chemical industries rank highest.

Solar's nitrogen chemicals are sold as far west as the Dakotas; north into Canada; south into Tennessee and Kentucky; and as far east as Maine.

The firm is jointly owned by the Atlas Powder Company of Wilmington, Delaware and the Standard Oil Company (Ohio).

### TEXAS GULF SULPHUR SALES UP 11% IN 1959

Gross revenue from sales of Texas Gulf Sulphur Co. in 1959 amounted to \$63,597,000, an increase of 11.5 per cent over the previous year's total of \$57,057,274, according to the firm's preliminary report.

Net income for the year a-

mounted to \$13,338,000, equivalent to \$1.33 per share on the 10,020,000 common shares outstanding. This compares with 1958 net income of \$13,383,967, or \$1.34 per share on the same number of shares.

Suspension of operations at its Mexican sulfur plant at Nopalapa, in the state of Vera Cruz, has been announced by Texas Gulf.

The decision is a simple matter of economy, according to the company. The Nopalapa plant is a small producer and its cost of operation is high relative to the company's other more efficient producing units.

### CONTROLLING INTEREST IN N.S. KOOS TO KICKAPOO

Purchase of controlling interest in N. S. Koos & Sons, Kenosha, Wisc., has been announced by Kickapoo Fertilizers. The stock purchase will make Kickapoo one of the Midwest's largest fertilizer producers, according to E. B. Baldrige, executive vice president and general manager of the company.

New officers include Phillip Q. Sawin, Madison, as president; Baldrige, executive vice president and general manager; Raymond A. Russell, Wisconsin Rapids, secretary; and Dorothy M. Sawin, Madison, treasurer.

### WITCO INCOME UP 24%

Net operating income for 1959 of \$2,028,200 was reported by Witco Chemical Co., Inc. and subsidiary companies consolidated in a preliminary report issued by Max A. Minnig, president. These results, subject to final audit, compare with \$1,638,300 in 1958, an increase of 24 per cent. Per share net operating income on the basis of average number of shares outstanding during each period amounted to \$2.66 per share in 1959 as compared with \$2.44 in 1958.

In 1958, 41 cents per share was realized from a non-recurring item of \$272,900 so that net income from all sources in 1958 totalled \$1,911,200.

Net sales and other income in 1959 came to a new high of \$51,567,400, an increase of 29 per cent over the \$39,942,700 reported for 1958.

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## IMC IMPORTS MINING TECHNIQUE FROM EUROPE

A mining technique proven in Europe but new in the Western Hemisphere is being imported by International Minerals & Chemical Corp. (Canada) Ltd. to assure "long-term efficiency and safety" in the operation of its potash mine now under construction in Saskatchewan.

Called tubbing, the technique employs a cast iron lining for the mine shaft. It is a vertical application of cast iron vehicular tunneling commonly used under rivers and lakes.

Dr. I. M. LeBaron, IMC vice president, who went to Toronto to approve engineering details of a \$750,000 contract with John Bertram & Sons, Dundas, to supply the lining, said it "will insure safety for as long as there's potash to be mined in the deposit."

The 300-foot lining, weighing 3,000 tons, will be used between the 1200 and 1500-foot levels of the shaft to wall off water-bearing Blairmore sands.

The German firm of Haniel & Luge, mining engineers who specialize in such work abroad, where tubbing has been used successfully in many deep shaft mines, will direct installation of the cast iron liner.

Company officials describe the potash ore deposit, located 3100 feet below ground near Esterhazy in Saskatchewan, as the "largest known deposit of high grade potash ore."

The shaft is now down to the 1200-foot level, where the Blairmore sands are being consolidated by freezing. Freezing was also employed to consolidate the glacial till before sinking the first 300 feet of the shaft.

The "tubbing" to be used in the Blairmore area actually will consist of 65 rings each five feet high, 18 inches thick, and 15 feet in diameter. Each ring is made up of 11 segments.

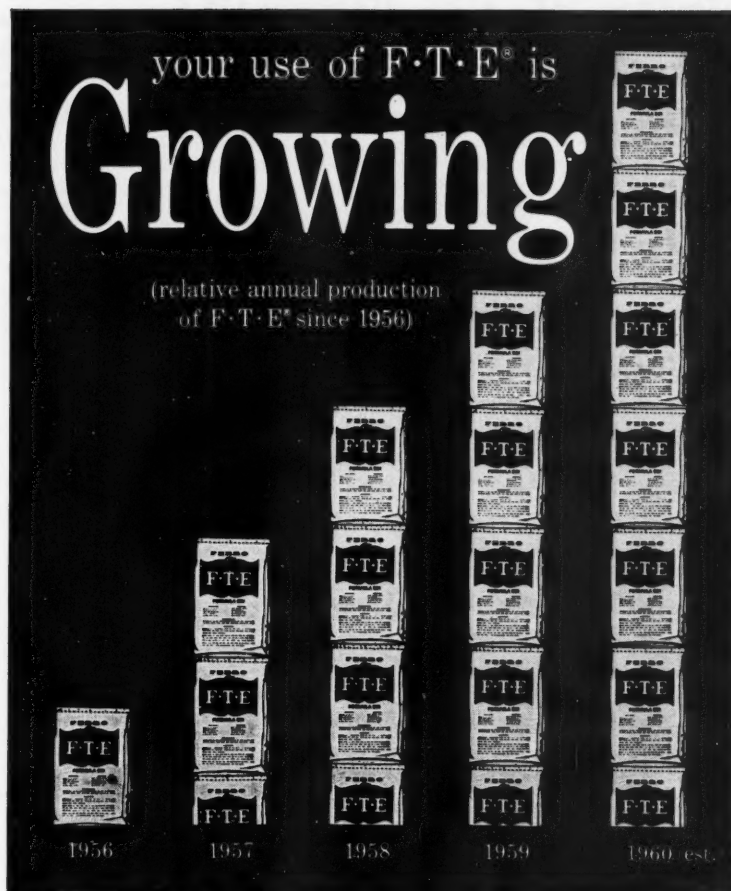
## PENNSALT OPENS NYC OFFICE

An Agricultural Chemicals office has been established by Pennsalt of Washington Div., Pennsalt Chemicals Corp., at 400 Park Avenue, New York City 22.

APRIL, 1960

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## NEWS OF THE INDUSTRY

### Calendar

**April 5-14.** American Chemical Society National Meeting, Cleveland, O.

**April 11-12.** Eighth Annual California Fertilizer Conference, McLane Hall, Fresno State College, Fresno, Calif.

**May 12-14.** American Institute of Chemists Annual Meeting, Radisson Hotel, Minneapolis, Minn.

**May 16-18.** Midyear Meeting, Chemical Specialties Manufacturers Assn., Drake Hotel, Chicago, Ill.

**May 17-18.** Chemical Market Research Assn. Annual Spring Meeting, Biltmore Hotel, New York City.

**June 9-11.** Manufacturing Chemists' Association Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

**June 12-15.** National Plant Food Institute Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.

**June 21-22.** Association of Southern Feed and Fertilizer Control Officials annual meeting, Riverside Hotel, Gatlinburg, Tenn.

**June 27-29.** Entomological Society of America, Pacific Branch, meeting,

Davenport Hotel, Spokane, Wash.

**July 13-15.** Pacific Northwest Fertilizer Conference, Hotel Utah, Salt Lake City.

**July 27-30.** Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Tex.

**August 25-27.** Mississippi Soil Fertility & Plant Food Council 1960 meeting, Buena Vista Hotel, Biloxi, Mississippi.

**Sept. 24-26.** Western Agricultural Chemicals Association 31st Annual Meeting, Palm Springs Riviera Hotel, Palm Springs, Calif.

**Sept. 29-30.** Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.

**Oct. 5-6.** Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

**Oct. 17-18.** National Safety Council, Fertilizer Section, National Safety Congress, Chicago, Ill.

**Nov. 13-15.** 37th Annual California Fertilizer Association Convention, del Coronado Hotel, Coronado, Calif.

### FLORIDIN CO. OPENS NEW SALES OFFICES

New sales offices have been opened by Floridin Co. in New York, St. Louis and Dallas. Donald H. Mowell, president, said that these offices would enable Floridin to offer pesticide formulators better service on its fuller's earth carriers, diluents and extenders. The firm's general sales offices are in Tallahassee, Florida.

### SMITH-DOUGLASS REPORTS 6 MO. SALES, EARNINGS

Net sales of \$19,948,252 for the six months ended January 31, as compared to \$16,211,871 for the same period last year, were reported today by Smith-Douglass Co., Inc.

Net income for the six months was \$1,270,901 and earnings per common share were \$1.23 compared to \$856,388 and 82 cents during the same period last year.

### SOUTHERN N EARNINGS UP NH<sub>3</sub> AGREEMENT SIGNED

Southern Nitrogen Co.'s net earnings in 1959 were \$832,000, equal to 66 cents a share, up from \$786,000 or 63 cents a share in 1958, the Wall Street Journal recently reported.

Signing of an agreement to buy about 30,000 tons of ammonia a year from Tennessee Corp. also

was announced. Southern Nitrogen said that shipments from Tennessee's plant, under construction at East Tampa, Fla., will begin in 1962.

### FARM CHEMICALS CALLED SAFE FOR HUMANS

High industry standards and "strict requirements" of laws are adequate to protect the public.

This assurance was given by J. V. Vernon, vice president of Food Machinery and Chemical Corp. and president of the National Agricultural Chemicals Association, in a paper opening a symposium on pesticides during the 42nd national meeting of the American Institute of Chemical Engineers at Atlanta, Ga. in February.

Noting that the California Department of Fish and Game Management had stated that pesticides seem to be only minor influences in nature and that Messrs. Hayes and Simmons of the Department of Health, Education and Welfare had decried "irresponsible" statements about farm chemicals, Vernon said:

"My observations are that the strict requirements of both Federal and State laws are adequate to protect the American people from any harmful effects. I can assure you that the industry's standards are high in this regard."

Vernon reported that the pesticide industry has grown from an annual \$30,000,000 business 25 years ago to \$280,000,000 today. He said, "It is estimated that over \$30,000,000 will be spent this year in the search for new and better agricultural chemical products."

### CSC REPORTS DOUBLED EARNINGS FOR 1959

Commercial Solvents Corp. 1959 consolidated net earnings rose sharply to \$1.02 per share on 2,796,250 shares of common stock and were double the company's earnings in 1958 and 1957, according to Maynard C. Wheeler, president.

Sales for the year of \$70,381,175 represented a nine per cent increase over the 1958 total of \$64,727,548.

Net earnings for 1959 were \$2,850,740, as compared with \$1,418,462 or 51 cents per share for 1958, and with \$1,449,638 or 52 cents per share for 1957 with the per share earnings for these two years adjusted to reflect the two per cent stock dividend issued Dec. 31, 1959.

The company's board of directors declared an increased regular dividend of 10 cents per share on outstanding common stock, payable March 31 to stockholders of record at the close of business on March 4.

### PYRENONE WINS GOLD MEDAL AWARD



Canner Packer magazine's Gold Medal Award for an "outstanding" insecticide, is presented to John A. Rodda (right), general manager of Fairfield Chemicals, Food Machinery and Chemical Corp. Thomas Vought, representing Canner Packer, makes the presentation. Fairfield's Pyrenone was one of fifty products chosen by the magazine's panel of judges to receive the award "for creative progress in processing foods."

FARM CHEMICALS

## Associations Meetings

### NAC OFFERS COOPERATION TO WISCONSIN COMMITTEE



Governor Nelson L. S. Hitchner

A meeting of Wisconsin Governor Gaylord Nelson's special committee to survey the use of chemicals in agriculture was held in Madison, Wisconsin on Thursday, February 25. Meeting with Governor Nelson prior to the committee discussion, Lea S. Hitchner, executive secretary of the National Agricultural Chemicals Association, complimented the Governor on his forthright step in establishing such an important and distinguished committee.

In addressing the group, Hitchner offered "the full cooperation of the pesticide industry in this urgent and important mission," and expressed the hope that a sound committee recommendation "would overcome the serious harm recently suffered by agriculture and by independent scientific research organizations."

The special committee, the first state-wide group of its kind in the nation, was created by Governor Nelson to develop a decisive and consistent public policy in respect to regulating the use of chemicals as feed supplements, food additives, pesticides, and growth regulators.

### SUGAR BEET TECHNOLOGISTS DISCUSS FERTILIZATION

Sugar beet fertilization was one of the topics up for discussion at the American Society of Sugar Beet Technologists meeting attended by some 600 members of

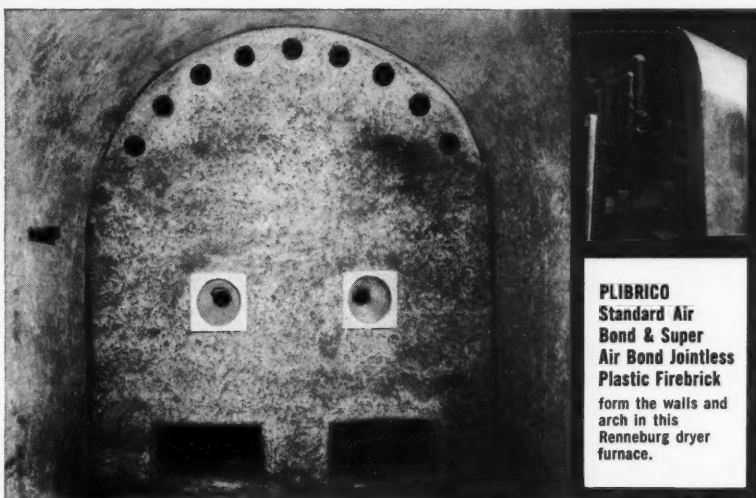
the society in Salt Lake City recently, according to Dr. R. B. Bahme who represented the National Plant Food Institute as western regional director at the meeting.

"General implications for research for the fertilizer industry coming out of the conference would indicate that perhaps studies should be made reviewing the recurrence of undesirable and desirable combinations of factors affecting sugar

production in beets," Dr. Bahme commented. "With this knowledge it could be predicted with some accuracy as to what per cent of the time high fertilization combined with good cultural practices would produce maximum sugar yields and profits."

### WEED SOCIETY NAMES NEW OFFICERS

K. P. Buchholtz of the University of Wisconsin was named



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## NEWS OF THE INDUSTRY

president of the Weed Society of America at the group's recent meeting in Denver, Colo.

Serving with him are W. C. Shaw, USDA, vice president; F. W. Slife, University of Illinois, secretary; W. C. Jacob, University of Illinois, treasurer-business manager; and C. J. Willard, The Ohio State University, editor of *Weeds*.

### UTAH CONFERENCES DRAW 110 PEOPLE



Conference speakers Christensen, Nelson, Burningham, Nielson and Farnsworth.

Paul Christensen (left) soils extension specialist for Utah State University, discusses the recently published Fertilizer Recommendation Bulletin with speakers at the Utah Fertilizer Industry Conferences held February 9-10 at Ogden and Provo. Listening are Elroy Nelson, First Security Bank; Melvin Burningham, county extension agent; Rex Nielson, soils specialist; and Dean Farnsworth, Phillips Petroleum Co. Other speakers on the two-day program included Elmer Christensen, Utah State chemist; J. P. Thorne and J. B. Peterson, Utah State University; and F. Todd Tremblay, National Plant Food Institute.



**CONFERENCE SPEAKERS.** Shown here are three who spoke during the Alabama Pest Control Conference. Left to right: Jack Dreessen, National Agricultural Chemicals Association; Dr. R. T. Ross, Buckman Laboratories, Inc., Memphis, Tenn.; and W. A. Ruffin, Auburn Extension entomologist.

### OFFICERS ELECTED BY AGR. AIRCRAFT ASSOCIATION

New officers elected by the Agricultural Aircraft Association, Inc., include Monty Landsiedel, president; Wayland S. Fink, vice president; John C. Coulston, secretary-treasurer; James K. Vedder, ex-officio; and Wanda Branstetter, executive secretary.

### SAFETY HANDBOOK TO BE PREPARED BY FERT. SECTION

A fertilizer industry safety handbook is one of the outstanding projects scheduled this year for the Fertilizer Section, National Safety Council, its Executive Committee decided at a meeting in February at the New Florida Hotel, Lakeland.

The handbook is to cover all safety measures needed in a fertilizer plant. Its construction is being engineered by John E. Smith, safety director of Spencer Chemical Co.

Vote of the executive committee

was unanimous to continue Supervisory Safety Training for the third consecutive year. Plans for this year's meetings will be announced shortly.

### KANSAS AIR APPLICATORS MEET IN GARDEN CITY

Bill Rucker, Burdett, Kansas, was re-elected president of the Kansas Aerial Applicators Association for 1960 during the association's annual meeting at the Warren Hotel, Garden City, Kansas, February 13. Other officers named for 1960 were Jack F. Hardesty, Ashland, Ks., vice-president; Mrs. Bill Rucker, Burdett, Ks. was re-elected as secretary and treasurer.

Eight directors were elected: B. L. Hinman, Plains; Courtney Sherwood, Copeland; Earl Whitaker, Copeland; Paul F. Kitchen, Wamego; and G. L. Johnson, Lakin, for their first year term. J. Frank Shaw, Johnson; Dale Simpson, Liberal; and Gilbert Legleiter, La Crosse, for their 3rd year term.

About 40 people from Kansas, Texas, and Colo. attended the 3rd annual meeting of the association. Regular members of the association have to be current licensed spray operators of the State of Kansas. Sustaining members may be chemical and aircraft manufacturers.

### PANEL DISCUSSES INSECT CONTROL AT WESTERN COTTON PRODUCTION CONF.

Greatest problem in counteracting some \$3 million worth of cotton insect damage last year in New Mexico is getting cotton producers to realize the value of investing in insect control when it is necessary.

That opinion was expressed by John J. Durkin, extension entomologist at the University of Mexico, member of a panel discussing insect control problems and recommendations at the Western Cotton Production Conference held March 1-2 in Bakersfield, Calif.

"We must make the cotton producer aware of the insect problem that he must overcome," Durkin said. "Then we have to show him that insects can be controlled and that chemical insect control, when necessary, pays dividends."



**Fertilizer Section, NSC, Executive Committee:** Back Row: E. O. Burroughs, Jr., F. S. Royster, Mike Ellison, Miss. Chem. Co.; A. B. Pettit, W. R. Grace; James Phillips (visitor) Davison Chemical; George Dietz, Fert. Mfg. Coop.; W. A. Stone, Wilson and Toomer; Frank Gerard, Olin Mathieson; Paul Truitt, NPFI; Stratton McCargo, GLF; M. A. Peterson, NSC. Middle Row: Carl Alkire, Davison Chemical; Dr. E. J. Largent, Reynolds Metals; D. W. Flagler, Davison Chemical; C. S. Griffith, Virginia-Carolina; Emerson Jones, Nitrogen Div.; Allied Chemical; Grayson Morris, Southern States Coop.; John E. Smith, Spencer Chemical; and W. C. Creel, N. C. Dept. of Labor. Sitting: Gaither Newnam, Smith-Douglas; Ansel Raney, Phillips Chemical; and Elmer Perrine, Nitrogen Div., Allied Chemical.



## People

**Amchem Products, Inc.** John R. Sterry, for the past 3½ years a technical service representative in the International Div., has been advanced to technical service supervisor for Europe. He will reside permanently in Zurich, Switzerland.

**The American Agricultural Chemical Co.** George E. Campbell, manager of the Purchasing Dept., died on Feb. 21 at his home in Flushing, New York. He was 64.

### American Cyanamid Co.



Tousey

Richard G. Tousey's appointment as product supervisor for herbicide and fungicide products was announced recently by B. F. Bowman, marketing director of Cyanamid's Agricultural Div. Tousey will report to the pesticide products manager, R. W. Yoder.

**Central Farmers Fertilizer Co.** W. T. Tillotson has been named general manager of the Idaho phosphate works. He has been a plant engineer, chief engineer and vice president in charge of manufacturing with two industrial minerals firms, U. S. Gypsum Co. and American Rockwool Corp.

### Chemagro Corp.

Dr. Robert W. Earhart becomes research biologist in the Research Dept. Before joining Chemagro, Dr. Earhart was professor of botany and plant pathology at Clemson Agricultural College.



Earhart

**Collier Carbon and Chemical Corp.** announces appointment of Edgar F. Whitmore as manager of industrial chemical sales.

**Columbia-Southern Chemical Corp.** Leroy C. Nelson succeeds William Carpenter as St. Louis district sales manager. Carpenter has been named assistant to the president of Pittsburgh Plate Glass Co.

**DuPont Co.** Howard A. Weibel, manager of the garden chemicals section, has received the Leaders of Industry award from *Garden Supply Merchandiser* magazine.



Beaman

### Farmers Cotton Oil Co.,

Fertilizer Div., has named Philip L. Beaman farm service representative. Before joining the company he taught agriculture in Warrenton, N. C.

**Food Machinery and Chemical Corp.,** Chemical Divs. Ralph Bloom, Jr. has been appointed as Washington, D. C. representative, replacing Philip H. Groggins. Groggins becomes senior scientific advisor. Donald C. Oskin has been named to the new position of vice president of executive sales of the Chemical Divisions. At the same time he has been appointed a member of the FMC Chemical Divisions' Executive Committee.

Niagara Chemical Div. appointments: Dr. Robert W. Metz as technical service to sales representative, and Dr. Irwyn Rammer as a research entomologist.

**Hercules Powder Co.** Mancefield Barrow, a senior technical sales service representative in Hercules' Naval Stores Dept., has been transferred to the Raleigh, N. C. office. He will be concerned chiefly with the agricultural program of the department in the Raleigh district.

### Jones & Laughlin Steel Corp.

Ralph B. Kelley is named assistant to manager, Coal Chemicals Div. in the company's Sales Dept.

**Koppers Co., Inc.,** Wood Pre-

serving Div. Donald F. Over has been appointed manager of advertising and public relations, and David E. Birkhimer, assistant manager.

**Chas. H. Lilly Co.** promotes three men to vice presidents: Fenn Emerson, Ernest E. White and Mal Tellvik.



Emerson



White

Since 1950 Emerson has managed anhydrous ammonia fertilizer distribution, eastern car lot seed sales and export seed sales. White, who joined Lilly Co. in 1928, is general manager of the firm. Tellvik is manager of the Western Washington credit, field seed operations and general purchasing.



Tellvik

**Long Island Produce & Fertilizer Co.** Frank S. Post, 49, assistant manager of the Fertilizer Div., died suddenly at Riverhead on March 1.

**Midwest Fertilizer Corp.** reports that James Kerrigan joined the firm recently in an executive capacity. Kerrigan was a founder and director of Vorhes Chemical Co. Raymond A. Russell, former comptroller, becomes assistant to the executive vice president and secretary.

### Monsanto Chemical Co.

Ralph E. Althaus goes to the firm's Organic Chemicals Div. as project manager in the agricultural chemicals section of its development department.

**Panogen Co.** Lin Mercil has been appointed North Central re-



## NEWS OF THE INDUSTRY

gional manager, and Gerald Zirbel sales representative in the region.

**Pennsalt Chemicals Corp.,** Agricultural Chemicals Div., has named Kenneth L. Houston technical sales representative, agricultural chemicals. He will service the lower Midwest territory, including Missouri and Kansas.

**Stauffer Chemical Co.** New sales representatives: Joseph H. Montriell, Imperial Valley, with headquarters at El Centro; Thomas H. Clemens, Arizona, with headquarters in Glendale; and Gaspar Torres Jr., West Coast of Mexico, locating in Hermosillo.

**Spencer Chemical Co.** Kenneth A. Spencer, chairman of the board and founder of the company, died Feb. 19 at the age of 58 at the St. Francis Hospital in Miami Beach, Fla., from complications following a heart attack he suffered Feb. 2.

He suffered the heart attack while concluding a vacation cruise with Mrs. Spencer in the Bahamas.

**Stepan Chemical Co.** Dr. David B. Hatcher, former vice president and general manager, becomes executive vice president and will coordinate operations of all divisions and subsidiaries. Wilfred J. Crepeau, former assistant general manager, becomes assistant to the executive vice president.

**Union Carbide Corp.** Crag Agricultural Chemicals appointments: M. J. Siciliano is now manager, sales services; J. B. Harry becomes sales manager; and Richard T. Dotzenrod is named sales representative with headquarters in Winchester, Va.

**U. S. Phosphoric Products,** Div. Tennessee Corp., Tampa, Fla., has announced the enlargement of its technical services, through the following appointments and changes:



Tatum



Shamp



Graf



Hall

H. B. Tatum has been named director of technical service and is now located in Tampa. He has been with U. S. Phosphoric since 1936, serving in production, maintenance, engineering, research, development, sales and technical service.

John A. Shamp, technical service representative with USPP for 17 years, is now living in Kansas City, Mo. His area consists of Kansas, Missouri, Nebraska, Arkansas, Texas, and the southern parts of Iowa and Illinois.

Robert D. Graf recently moved to Minneapolis from Tampa. He has been with the firm for eight years, in research, development, production and technical service. Graf's territory consists of Minnesota, Wisconsin, North Dakota, South Dakota and northern Iowa and Illinois.

Robert L. Hall, technical service representative, went to USPP from the University of Illinois. He is living in Richmond, Ind., and servicing customers in Indiana, Ohio, Michigan and Kentucky.

**Witco Chemical Co., Inc.** J. Porter Brinton, Jr., has been elected a director. He continues as chairman of the boards of two recently acquired, independently operated Witco subsidiaries: Tar Distilling Co., Inc., and Old Colony Tar Co., Inc.

## Chemicals

### LEGUMES GROWN IN ACID SOIL RESPOND TO MOLY

A recently completed series of greenhouse experiments conducted by Cornell University's Department of Agronomy shows that birdsfoot trefoil and ladino clover are markedly benefited by soil treatments with molybdenum compounds. Alfalfa was benefited to a limited degree by soil treatment with molybdenum.

The experiments were run on several samples of Mardin silt loam soil and showed that small additions of molybdenum ( $\frac{1}{2}$  pounds sodium molybdate per acre) make it possible to obtain good yields of birdsfoot trefoil at lower levels of liming than if molybdenum is not applied.

Used alone, the molybdenum increased yields of birdsfoot trefoil by as much as 130 per cent over untreated soils. Yields from soils limed at a one-ton per acre rate showed an increase of 40 per cent when molybdenum compounds were also used. When liming reached the two-ton rate additional molybdenum no longer had an appreciable effect. In the tests, molybdenum compounds were applied both as soil sprays and dusts.

Molybdenum benefits the legume crops indirectly by helping the root nodules fix atmospheric nitrogen found in the soil. Thus, before legumes can respond to the element the plants must be nodulated. It was found in the Cornell experiments that RHIZOBIUM bacteria were able to induce this nodulation on birdsfoot trefoil and ladino clover even in the complete absence of lime, although the alfalfa did not respond.

The experiments indicate that although molybdenum is not a substitute for lime, it may be very valuable insurance against underliming—particularly for birdsfoot trefoil. Cornell now plans to continue its studies to verify these greenhouse results in field tests.

Climax Molybdenum Company and Grange League Federation (GLF) are concurrently sponsoring a grant at the University to aid in this work.

## DOWPON RECOMMENDED FOR PEACH ORCHARDS

Dowpon is now being recommended for control of grasses around established peach trees in non-irrigated orchards. The practice has been registered with federal regulatory agencies, according to The Dow Chemical Co.

Spray solution is mixed at the rate of one pound of Dowpon in 20 gallons of water and applied to wet the grass. Application should be made lightly, without causing run-off on the ground.

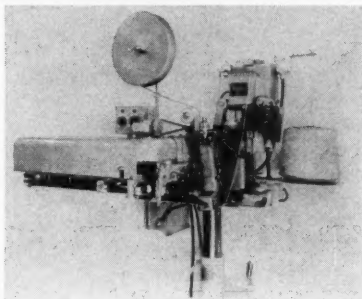
## SEVIN CLEARED FOR USE ON 4 MORE FRUIT CROPS

USDA has granted Sevin label acceptance for use on four additional fruit crops: plums, prunes, cherries and strawberries, according to R. H. Wellman, manager of Crag Agricultural Chemicals, Union Carbide Corp.

A residue tolerance of 10 ppm has been established for Sevin on these four crops.

## Equipment Supplies

### THERMOPLASTIC TAPE-TOP BAG CLOSING MACHINE



A Thermoplastic Tape-Top bag closing machine designed to apply a thermoplastic tape closure over sewing on open-mouth multiwall shipping sacks has been developed by Bemis Bro. Bag Company.

The Thermoplastic Tape-Top machine, designed and built by the company's Packaging Service unit, effects a bag closure providing

maximum protection against contamination from outside particles, prevents infestation of bags and eliminates sifting of fine products, according to the company. The closure creates a moisture barrier to prevent "caking" of hygroscopic products and retains its physical and chemical characteristics over the full range of temperatures encountered in bagged products.

In operation, the Thermoplastic Tape-Top bag closing machine first makes a standard sewn closure. The thermoplastic tape, Bemistape 400, is immediately folded and creased over the stitches and then heat-sealed under controlled temperature and pressure to give maximum protection.

Starting, thread cutting, and tape application and cutting components are automatic. Once the filled bag enters the Bemis sewing guide no further operator assistance is required.

Additional information is available by

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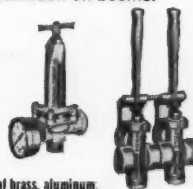
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## NEWS OF THE INDUSTRY

### 30,000 GAL. TANK CARS UNDER CONSTRUCTION

Union Tank Car Co. is constructing two railroad tank cars of 30,000 gallon shell capacity each for use by Tuloma Gas Product Co.

Each of the new cars will have a shell capacity almost three times that of today's average-sized cars. They will measure 85 feet over the couplers.



Tank shells for the Hot Dog-30 cars are being fabricated by Graver Tank & Mfg. Co. When they are delivered to Toloma this spring, the cars will be put into service carrying LP-gas shipments.

### PRESSURE RELIEF VALVE HAS DIAPHRAGM DESIGN

A new pressure relief valve has been introduced by Spraying Systems Co. for use on farm sprayers.

Liquid-contact face of the valve is a special corrosion resistant diaphragm that results in responsive, chatter-free pressure control, the manufacturer said. Supporting the setting of the diaphragm is a dual stainless steel spring assembly, consisting of a light spring for the lower pressure range and a heavy spring for the high pressure range. As a result, sensitivity to all pressure settings up to 300 psi is obtained.

All parts of the valve that come in contact with chemicals are made of nylon and stainless steel. For a bulletin,

CIRCLE 132 ON SERVICE CARD

### HOUGH ANNOUNCES NEW 4-WHEEL DRIVE PAYLOADER

The Frank G. Hough Co. has just announced a new tractor-shovel of a size and type never before available in their Payloader line.

This new Model H-30 has an operating capacity of 3,000 lbs. and is equipped with a one cu. yd. (S.A.E. rated) bucket.

The four-wheel-drive features Hough's own full power-shift Paylomatic transmission with matched torque-converter. With three speed ranges in each direction, all shifts can be made "on-the-go"



with no need to stop for "range" shifts.

The H-30 is powered with a 77½ hp heavy-duty gas engine. Clearance of 8'-4" under the cutting edge, with bucket in dumped position, is even greater than some larger machines as is the 29" dumping reach ahead of the front tires, Hough said.

Among its other features: four-wheel hydraulic brakes, boom structures positioned ahead of and away from operator for utmost safety; and dual foot brake pedals.

Production of this new H-30 Payloader is scheduled to begin this month. For complete information and specifications,

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## Suppliers Briefs

**Bemis Bro. Bag Co.** F. G. Bemis, Jr., manager of the plant in East Pepperell, Mass., has been named director of allied operations



Bemis



Rodgers

for the company. He is succeeded at East Pepperell by Walter I. Rodgers, who has been assistant to the manager. Bemis moves to the general offices in Boston.

**Chase Bag Co.** Edwin S. Elgin, vice president of the Plastics Div. of Chase, has been elected president of the National Flexible Packaging Association.

James F. Pouchot has been named product manager of waterproof and crinkled paper products.

**Chippewa Plastics Co.** has established a Chicago sales office at 5111 Sheridan Road N. George N. Keyser, field sales manager, heads up the new office.

**Highway Equip. Co.** P-D Service, Inc., Pavilion, N. Y., is a new distributor for "New Leader" spreaders and blenders. They serve a 20-county area in western New York.

**St. Regis Paper Co.'s** Bag Division office at Columbus, Ohio, has been moved from 17 North 4th Street to 2256 East Main Street.

**Vulcan-Associated Container Companies, Inc.** has been formed by the merger of seven container manufacturers, according to Gordon D. Zuck, president of the new company. The new organization will have its headquarters and executive office at Birmingham, Ala.

Companies merged into the new corporation are Vulcan Containers, Inc., Bellwood, Ill.; Vulcan Steel

Container Co., Birmingham, Ala.; Southwestern Steel Container Co., Dallas, Tex.; Vulcan Containers Ltd., Toronto, Canada; Vulcan Containers Ltd., Vancouver, B.C., Canada; Vulcan Containers Pacific, Inc., San Leandro, Calif.; and Atlantic-Vulcan Steel Containers, Inc., Peabody, Mass.

Zuck said that while the parent company will own all stock of the merged companies, each company will maintain its corporate identity and will operate individually in

each area.

Vern I. McCarthy, Sr. will serve as chairman of the board of directors of the new corporation; Fred A. Kusta as vice president; Paul H. Oberholtzer, secretary; and Vern I. McCarthy, Jr., treasurer.

**West Virginia Pulp and Paper** has appointed Tom R. Jones sales representative for its multiwall bag division in western New York state succeeding George H. Doherty, retired.



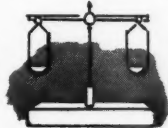
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# the FERTILIZER situation for 1959-60

By HAROLD H. SHEPARD, in charge  
JOHN N. MAHAN, fertilizer specialist, and  
CHARLOTTE A. GRAHAM, administrative assistant\*

**Table 1.—NITROGEN: estimated supply of nitrogen for fertilizer purposes, 1958-59 and 1959-60, United States and possessions**

Item	1958-59 <sup>1</sup>	1959-60
<b>Supply from domestic sources</b> (1,000 short tons of N)		
<b>Solids:</b>		
Ammonium nitrate <sup>2</sup> .....	415	439
Ammonium sulfate <sup>2</sup> .....	364	346
Urea.....	115	131
All other solids.....	208	238
Total solids.....	1,102	1,154
<b>Liquids:</b>		
Ammonia (including aqua)....	827	925
All other.....	770	895
Total liquids.....	1,597	1,820
<b>Total (solids and liquids).....</b>	<b>2,699</b>	<b>2,974</b>
<b>Imports</b>		
Ammonium nitrate.....	77	45
Ammonium sulfate.....	38	60
Urea <sup>2</sup> .....	14	19
Ammonium nitrate-limestone mixtures.....	26	26
Sodium nitrate.....	72	76
All other.....	67	90
<b>Total.....</b>	<b>294</b>	<b>316</b>
<b>Exports</b>		
Ammonium nitrate.....	31	25
Ammonium sulfate.....	86	80
Urea.....	38	16
Ammonia (including aqua)....	38	62
All other.....	30	36
<b>Total.....</b>	<b>223</b>	<b>219</b>
<b>NET DOMESTIC SUPPLY.....</b>	<b>2,770</b>	<b>3,071</b>

<sup>1</sup> Revised. <sup>2</sup> Adjusted for estimated quantity going into non-fertilizer uses.

USDA report estimates that fertilizer material supply

**S**UPPLIES of fertilizer materials are expected to total 8,085,000 tons of plant nutrients—nitrogen (N), phosphate (P<sub>2</sub>O<sub>5</sub>) and potash (K<sub>2</sub>O)—for 1959-60. This tonnage is 5.2 per cent higher than the unexpectedly large total of 7,685,000 tons which was available in 1958-59 when supplies proved to be 14 per cent greater than in 1957-58.

Despite the increase in total supplies, such factors as the growing complexity of the industry, the need to provide the variety of materials demanded, and the increasing quantity of fertilizers that must be moved in a short period of time, may create apparent scarcities in the midst of plenty.

Transportation systems are limited in the quantity of fertilizers that can be moved in one day. Plants are limited in the quantity that can be manufactured or loaded on carriers, and because orders for a specific product cannot always be anticipated, stocks may become exhausted. Thus, spot orders, especially orders for anhydrous ammonia, nitrogen solutions, ammonium nitrate, concentrated superphosphate, and phosphoric acid, may go unfilled in some areas during the busiest part of the season. Needs for short items may be magnified when duplicate orders are placed with several producers.

Estimates of supplies for 1959-60 shown in this report are based on stock trends, rates of production, and foreign trade during the first six months of the fertilizer year.

Although 70 per cent of sales are made in the last four months of the fertilizer year<sup>1</sup>, from 40 to 55 per cent of primary fertilizer materials are manufactured in the first six months. Production schedules are based largely on sales anticipated by primary producers and mixers as reflected by the attitude of dealers and farmers.

Rates of production during the first half of the 1959-60 fertilizer year were above those last year and it is believed generally that they will continue so during the last half of the year. Primary producers were strongly optimistic toward mid-year. December production was the largest of any month in the history of the industry for each of the following: anhydrous ammonia, fertilizer grade ammonium nitrate solution, synthetic ammonium sulfate, nitric acid, urea and wet process phosphoric acid.

Inventories of primary producers, as well as those in other segments of the industry, were depleted last spring when sales exceeded expectations as gauged by production rates. Consequently, the accelerated production last summer was presumed to be for fall sales and rebuilding inventories. Stocks of primary pro-

<sup>1</sup> The fertilizer year is from July 1 Through June 30.

\* Agricultural Chemicals Staff, Commodity Stabilization Service, Food and Materials Requirements Division, U. S. Department of Agriculture, Washington, D. C.

supplies for 1959-60 will total 8,085,000 tons, up 5.2% from last year's high total.

ducers at the end of December, however, were still below those a year earlier, except for anhydrous ammonia, nitrogen solutions and normal superphosphate.

## NITROGEN (N)

Estimates indicate that supplies of nitrogen for fertilizers in 1959-60 will total 3,071,000 tons of N (table 1), an increase of approximately 11 per cent over the previous record quantity for 1958-59.

Ammonium sulfate is in better supply than was anticipated earlier. Production was reduced less as a result of the steel strike than many feared and during the rest of the fertilizer year, it is expected to be at a high level. Producers of synthetic sulfate helped to bridge the gap. Also, exports have been somewhat lower and imports higher this year than last.

Production of fertilizer grade ammonium nitrate solution continues to climb—enough to provide increased supplies of solid ammonium nitrate, of ammonium nitrate solution, and of ammonium nitrate-limestone mixtures. The increase may be greater than is reflected in statistics on production because less of the quantity going to non-fertilizer purposes is being classified as fertilizer grade ammonium nitrate.

Ammonium phosphate produced for shipment as such will reach a new high level in 1959-60.

Liquid nitrogen supplies will again reach a record level, rising to about 61 per cent of the domestic supply of nitrogen. In every month from July through December, anhydrous ammonia production was at a record high for that month, and December production was the largest ever for any month. Production for July through December was 21 per cent greater than in the same period last year. Indications are that anhydrous ammonia (including aqua) supplies for fertilizer use will be increased about 98,000 tons of N in 1959-60 and supplies of nitrogen solutions will rise even more.

Domestic production of urea is at a rate of about 35,000 tons of N ahead of last year. About 24,000 tons of this will be fertilizer grade, liquid and solid. Urea import data have been adjusted to allow for estimated quantities going into non-fertilizer uses. Exports are expected to be down to somewhat less than half those of last year. One domestic producer is reported to have withdrawn from the export market during the current fertilizer year.

Currently, 58 anhydrous ammonia plants are on stream with an estimated capacity of 4.1 million tons of N. Only two new plants have come into production during this fertilizer year. One other plant under construction may be on stream before June 30, 1960. Plans for the construction of two more plants were announced recently.

By-product ammonia capacity is estimated to have been 220,000 tons of N on January 1, 1960.

Fourteen urea plants are on steam with an esti-

**Table 2.—PHOSPHATE: estimated supply of  $P_2O_5$  for fertilizer purposes, 1958-59 and 1959-60, United States and possessions**

Item	1958-59 <sup>1</sup>	1959-60
1,000 short tons of available $P_2O_5$		
<b>Supply from domestic sources</b>		
Normal and enriched superphosphate.....	1,400	1,346
Concentrated superphosphate.....	900	916
Ammonium phosphate <sup>2</sup> .....	186	227
All other <sup>1</sup> .....	318	378
<b>Total.....</b>	<b>2,804</b>	<b>2,867</b>
<b>Imports</b>		
Ammonium phosphate.....	42	69
All other.....	22	15
<b>Total.....</b>	<b>64</b>	<b>84</b>
<b>Exports</b>		
Normal superphosphate.....	36	29
Concentrated superphosphate.....	143	130
Ammonium phosphate.....	15	20
All other.....	10	11
<b>Total.....</b>	<b>204</b>	<b>190</b>
<b>NET DOMESTIC SUPPLY.....</b>	<b>2,664</b>	<b>2,761</b>

<sup>1</sup> Revised. <sup>2</sup> Liquid and solid ammonium phosphate shipped as such by primary producers. <sup>3</sup> Includes ammonium phosphate (produced in combination with potash salts to make mixed fertilizers), nitric phosphates, sodium phosphate, wet base goods, calcium metaphosphate, natural organics, phosphate rock and colloidal phosphate, basic slag, and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

**Table 3.—POTASH: estimated supply of  $K_2O$  for fertilizer purposes, 1958-59 and 1959-60, United States and possessions**

Item	1958-59 <sup>1</sup>	1959-60
(1,000 short tons of $K_2O$ )		
<b>Supply from domestic sources</b>		
Potassium chloride.....	2,180	2,205
Potassium sulfate <sup>2</sup> .....	123	127
All other.....	20	20
<b>Total.....</b>	<b>2,323</b>	<b>2,352</b>
<b>Imports</b>		
Potassium chloride.....	177	218
Potassium sulfate <sup>2</sup> .....	37	35
All other.....	24	18
<b>Total.....</b>	<b>238</b>	<b>271</b>
<b>Exports</b>		
Potassium chloride.....	284	346
Potassium sulfate.....	17	14
All other.....	9	10
<b>Total.....</b>	<b>310</b>	<b>370</b>
<b>NET DOMESTIC SUPPLY.....</b>	<b>2,251</b>	<b>2,253</b>

<sup>1</sup> Revised. <sup>2</sup> Includes sulfate of potash-magnesia.

## THE FERTILIZER SITUATION (Continued from page 61)

mated capacity of 840,000 tons of urea. Another plant, now under construction, will swell the total to 913,000 tons before the end of the fertilizer year. Plants now producing solid fertilizer grade ammonium nitrate in the United States number 19. Four domestic plants are now equipped to produce ammonium nitrate-limestone mixtures.

### PHOSPHATE ( $P_2O_5$ )

It is estimated that supplies of  $P_2O_5$  for 1959-60 will total 2,761,000 tons (table 2), or 3.6 per cent more than were available in 1958-59.

Normal and enriched superphosphate supplies will be smaller than they were last fertilizer year unless production is accelerated to fill  $P_2O_5$  needs for less available concentrated products. Even though the supply of concentrated superphosphate is expected to be larger this year than last, this material is in tight supply and may be very short during the season's peak.

Ammonium phosphate supplies as such will be up about 63,000 tons of  $P_2O_5$ .

Other phosphates will be up about 52,000 tons of  $P_2O_5$ , principally as ammonium phosphate produced in combination with potassium salts and phosphoric acid for direct application and mixtures (liquid and solid). Imports of other phosphates are expected to be about two-thirds those of last year.

Phosphoric acid (wet and furnace) in 1958-59 totaled an estimated 138,000 tons of  $P_2O_5$ , less than anticipated mid-way of last season. For 1959-60, the total is expected to be about 194,000 tons, a net increase of 56,000 tons. Elemental phosphorus and furnace acid contributed in all forms an estimated 166,000 tons of  $P_2O_5$  to fertilizer supplies last year. The total this year is expected to be about 171,000 tons. Furnace acid as such for fertilizer purposes is in tight supply and is expected to be very short during the spring rush.

Plants under construction and proposed projects may result in a sizable expansion of  $P_2O_5$  capacity based on wet process acid. Several of the projects are to increase capacity and/or provide flexibility in operations which will enable producers to supply  $P_2O_5$  in the form desired by the trade whether it be phosphoric acid, concentrated superphosphate, or ammonium phosphate.

Producers of elemental phosphorus are expanding facilities and one furnace acid plant is under construction. How much of the increased supply will be available for fertilizer purposes has not been indicated.

### POTASH ( $K_2O$ )

Deliveries during the first six months of the fertilizer year indicate that net domestic potash supplies in 1959-60 will total 2,253,000 tons of  $K_2O$  (table 3), about the same level as last year.

Graduated price discounts were in effect during the first six months, changing bi-monthly for potassium chloride (muriate) and quarterly for potassium sulfate. In each month just prior to the bi-monthly discount reduction (increase in price), deliveries of muriate were about twice the movement in the previous month. However, total domestic deliveries in the first six months were at an annual rate about 38,000 tons of  $K_2O$  below 1958-59. Potassium sulfate deliveries were at a rate about 7,000 tons above that of last year.

Producers' inventories of potash are lower than they have been during the two previous years, and deliveries in the last six months will be more dependent on current production than in the past. Inventories at the end of the year will be even lower than at present if indicated deliveries for domestic use and export are maintained.

Potash imports have been greater than in the corresponding period a year ago. Even though East Germany announced last spring that it was withdrawing from the United States market, recent news items indicate that the Soviet Union is joining West Germany, France and Spain as a supplier of potash. The reported price of Soviet Union potash, which is lower than French or West German prices, appears attractive to East coast fertilizer manufacturers. The advantage of imported potash disappears rapidly farther inland. Exports are expected to be 60,000 tons of  $K_2O$  larger than those a year ago.

Estimated domestic production capacity is about 2,500,000 tons of  $K_2O$ . No new production came in during 1958-59 nor is any expected during 1959-60.

Production difficulties were encountered at the Canadian potash facilities. The plant which had started production is down and any production in Canada during the current fertilizer year is unlikely. ▲

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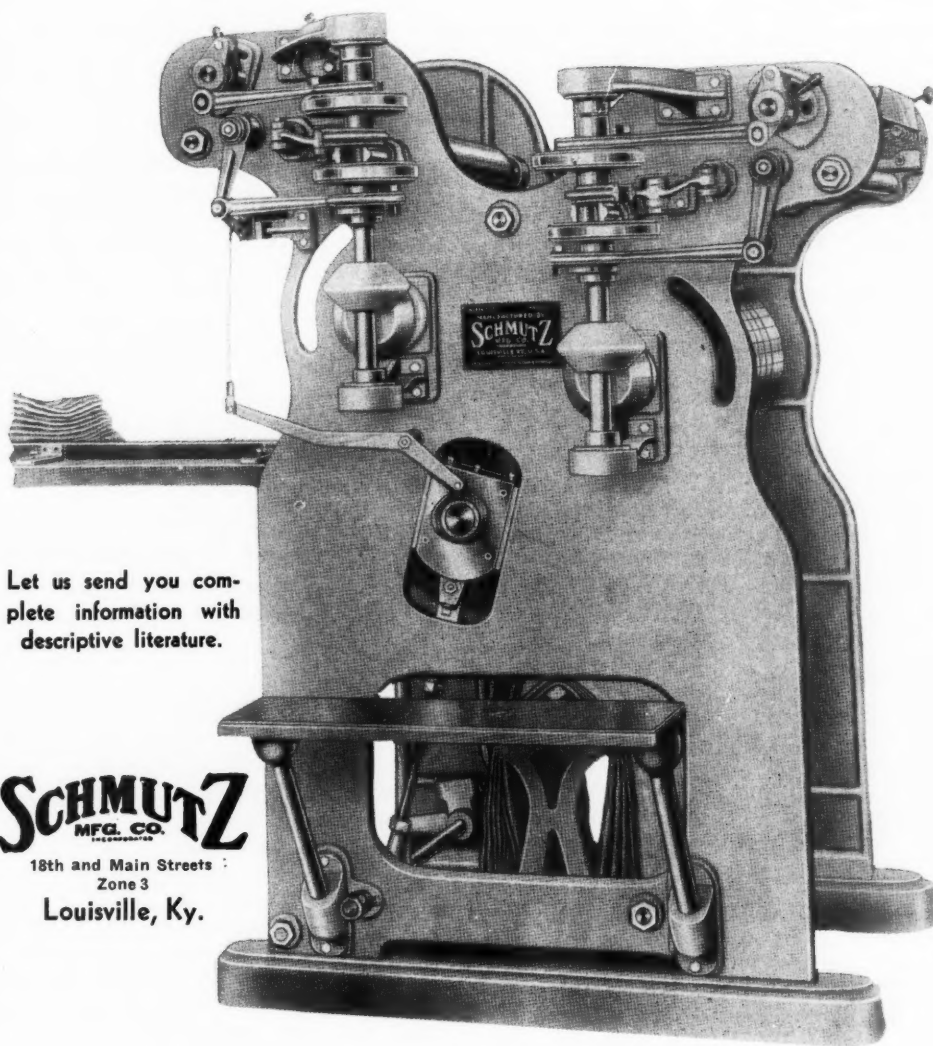
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**G**ENERALLY, pesticides are manufactured as technical preparations. The pesticides in this form are of little value for agricultural usage; consequently, the manufacturers formulate the pesticides into usable preparations. Dusts are, in general, formulated at concentrations that are used in field applications, at dilutions of from about 1 to 20 per cent. These dust preparations are fairly stable and can be handled easily by farmers.

## Selling Dilutions Is Impractical

It is impractical, however, to market pesticides as dilute sprays, since such preparations are generally unstable in water, and at concentrations generally used agriculturally or by pest control operators are too bulky to be practical. The pesticides are marketed, therefore, as spray concentrates. Spray concentrates are prepared for use in water as wettable powders, soluble powders, emulsifiable concentrates, or miscible concentrates.

The percentage of technical pesticide is indicated on packages of wettable or soluble powders, and this percentage must be used in calculations to prepare a diluted spray. Both percentage and pounds per gallon of technical pesticide generally are indicated on labels of emulsifiable or miscible concentrates. The percentage figure is generally used in calculations of dilute sprays to be applied to animals, fruit trees, ornamentals, and the like, where a certain percentage of pesticide is recommended. The pounds of technical pesticide per gallon are generally used in calculations when the recommendation calls for so many pounds per acre, primarily for use in fields.

## Wettable Powders

In wettable powder preparations the insecticide particle size is larger than in the other three forms. Here, a concentrated powder, or dust base, is treated with some material, a wetting agent, that will allow the pesticide to be suspended in water. Continuous agitation or mixing may be required to insure an even distribution of the pesticide in the mixture. It may also contain a spreader or sticker. In general, wettable powder preparations are less toxic to animals than emulsions or solutions. Disadvantages of wettable powders are (1) The particle size prevents use of small nozzles because of clogging and nozzle erosion, (2) considerable agitation is required in spray tank, and (3) gear type or roller pumps are ruined by the abrasive action of the powders. Consequently, emulsions or solutions may be preferable over the suspensions, even though the oils used in emulsifiable concentrates and smaller particles size allow for much quicker entry into the animal body. These preparations require more care in handling, particularly of the concentrate.

# how to

# CALCULATE P

By **GEORGE H. BLAKE, JR.\***

**P**ROBLEMS of pesticide dilution exist only in spray preparations, since dusts come ready for use.

Wettable or soluble powders require a different treatment from spray concentrates, since here we are dealing with a solid material. Powders contain a certain percentage of pesticide per pound of preparation, and to arrive at a given concentration or dilution in per cent, the pounds of diluent, generally water, must be determined. As an example: You have a 25 per cent wettable powder and want to prepare 100 gallons of a 2 per cent spray.

## Determine Pounds of Finished Spray

Initially, you must determine the number of pounds of finished spray, or 100 gallons times the weight of

$$1 \text{ gallon of water, } 8.34 \text{ pounds } \left( \frac{8.34}{100} \right) = 834$$

pounds of finished material. Now determine the number of pounds of technical or actual pesticide needed or  $834 \times 2 \text{ per cent} = 834 \times 0.02 = 16.68 \text{ pounds actual pesticide.}$

Following this, we must determine the number of pounds of a 25 per cent powder needed to obtain 16.68 pounds of actual pesticide, or  $16.68 \div 0.25 = 66.72 \text{ pounds of 25 per cent W.P./100 gallons of water to give a 2 per cent spray.}$  This is generally the manner in which such dilutions are made, *and for all practical purposes will suffice.* Technically, however, the percentage is not correct, since you have added 66.72 pounds to 834 pounds of water. To make the percentage exact, it is necessary to subtract the 66.72 pounds from the 834 pounds, or 767 pounds of water. In terms of gallons of water this is  $66.72 \div 8.34 = 8 \text{ gallons water from 100 gallons, or 92 gallons of water.}$  Therefore, to be exact, we must add 66.72 pounds of a

\* Associate Entomologist, Auburn University Agricultural Experiment Station. Presented at the Alabama Pest Control Conference, February 17-18, 1960.

# PESTICIDE DILUTIONS

*Pesticides manufactured as technical preparations have little value for agricultural use; The author discusses several methods of formulation for usable preparations.*

25 per cent wettable or soluble powder to 826 pounds of water to obtain a 2 per cent finished spray.

Example No. 2. Prepare 50 gallons of a 0.5 ( $\frac{1}{2}$ ) per cent spray using a 15 per cent wettable powder.

$8.34 \text{ pounds/gallon} \times 50 \text{ gallons} = 417 \text{ pounds water}$

$417 \times 0.5 \text{ per cent} = 417 \times 0.005 = 2.085 \text{ pounds technical per 50 gallons or 417 pounds.}$

$2.085 \div 15 \text{ per cent} = 2.085 \div 0.15 = 13.9 \text{ pounds of a 15 per cent W.P. in 50 gallons of water} = \text{a } \frac{1}{2} \text{ per cent spray, for all practical purposes.}$  Another common shortcut in figuring such dilutions is to use the weight of water as 8 rather than 8.34 pounds per gallon or 800 pounds per 100 gallons. Such shortcuts are permissible in many cases, but where *toxicity* or *phyto-toxicity* or *control* is *marginal*, the dilutions should be made as corrected in the first example.

## For A Simple Spray Dilution

To obtain a simple dilution from one concentration to another, as for spray preparations used on animals, ornamentals, etc., the following method can be used. Prepare a 1 per cent spray using a 25 per cent emulsifiable concentrate (2 pounds technical per gallon). This is a simple dilution problem, and the pounds per gallon figure is not needed. One per cent goes into 25 per cent 25 times or the proportion is 1:24; therefore, one gallon, one quart, one pint, or one of any unit of liquid measure of the concentrate diluted with 24 gallons, 24 quarts, 24 pints, or 24 of any similar unit of liquid measure of water or other diluent will give the desired concentration. Another way to state such a dilution is: use 1 part of the concentrate and *build up* to 25 parts with water; i.e., use *concentrate* in *quantity* or *diluted percentage* and *build up* to *quantity* of *concentrate percentage*.

Example No. 2. Prepare 50 gallons of a 0.5 per cent spray in water from a 50 per cent emulsifiable concentrate (4 pounds per gallon).

The proportion is  $50 \div 0.5$  (or  $0.5 \div 0.005$ ) = 100, or a proportion of 1 to 99; therefore, use  $\frac{1}{2}$  gallon of the concentrate and build up to 50 gallons with water

or  $\frac{1}{2}$  gallon of concentrate and  $49\frac{1}{2}$  gallons of water, to obtain the desired concentration of 0.5 per cent.

## Diluting Emulsifiable Concentrates

To determine dilutions of emulsifiable concentrates for field use, let us assume that two pounds of a certain pesticide is recommended per acre, and the concentrate contains 2 pounds of technical pesticide per gallon (25 per cent). How must I prepare my spray? It is necessary to calibrate the sprayer and determine the number of gallons of diluent, say water, the sprayer delivers per acre. Assuming that the sprayer delivers 20 gallons per acre and each gallon of the concentrate contains 2 pounds of pesticide, one gallon of the concentrate must be added to each 19 gallons of water. In the same example, if only  $\frac{1}{2}$  pound of the pesticide per acre is needed, one quart of the concentrate must be added each  $19\frac{3}{4}$  gallons of the water, since each quart would contain  $2 \div 4$  or 0.5 pounds of pesticide.

Another example: The sprayer delivers for adequate coverage 8 gallons of water per acre. The spray concentrate contains 4 pounds of technical material per gallon, and the recommendation calls for  $\frac{1}{2}$  pound of pesticide per acre. How is the spray prepared? Divide 4 (pounds/gallon) by  $\frac{1}{2}$  (pounds/acre) = 8 or  $\frac{1}{2}$  over 4 =  $\frac{1}{8}$  gallon (1 pint) of technical needed per acre; therefore, use 1 pint of concentrate in each  $7\frac{7}{8}$  (or 8) gallons of water.

## SUMMARY

1. *Wettable or soluble powders*—must figure weight for weight based on technical insecticide, or pounds of powder per pounds of diluent (water).

2. *Liquid concentrates*

a. Simple dilution—use quantity (liquid) of concentrate equal to percentage of desired dilution in a quantity (liquid) of diluent (water or oil) equal to percentage of concentrate.

b. Field use—(pounds of pesticide per acre). Calibrate sprayer—for each acre to be sprayed, place liquid quantity of concentrate containing desired pounds of technical pesticide per acre in spray tank and build up to number of gallons that sprayer delivers per acre. ▲

# PATENT REVIEWS

**F  
C**

By Dr. Melvin Nord

## HERBICIDES AND PLANT GROWTH REGULANTS

**U. S. 2,910,353**, issued Oct. 27, 1959 to Willard B. Jordan and assigned to Olin Mathieson Chemical Corp., discloses the use of 2,4-dichloro-6-nitrophenol as an herbicide for reducing the growth of weeds.

**U. S. 2,913,323**, issued Nov. 17, 1959 to Margaret D. Cameron and assigned to Monsanto Chemical Co., discloses an herbicidal composition employing bis (2-methyl-5-ethylpyridine) copper (II) chloride. It is especially useful as a broad-leaf contact herbicide.

**U. S. 2,913,324**, issued Nov. 17, 1959 to Milton Kosmin, assigned to Monsanto Chemical Co., provides new sulfoethyl carboxylic acid ester plant growth regulants which are useful as herbicides, in the treatment of tobacco, cotton, etc.

**U. S. 2,913,325-8**, issued Nov. 17, 1959 to Harry Tilles et al and assigned to Stauffer Chemical Co., disclose the use of certain thiolcarbamates as herbicides.

**U. S. 2,914,392**, issued Nov. 24,

1959 to John J. D'Amico and assigned to Monsanto Chemical Co., discloses the use of certain sulfenamides for destroying vegetation.

## PESTICIDES

**U. S. 2,910,401**, issued Oct. 27, 1959 to Irving D. Webb and John W. Yale, Jr., and assigned to Collier Carbon & Chemical Corp., discloses the pesticidal properties of certain sulfurized compounds of unknown structure obtained by reacting tetrakis (alkylmercapto) ethanes with elemental sulfur. They may be used to control nematodes, fungi, and plant-inducing bacteria.

**U. S. 2,911,335**, issued Nov. 3, 1959 to Everett E. Gilbert and assigned to Allied Chemical Corp., discloses a new class of thiophosphate ester fungicides, having the general formula  $(RO)_2 PSSCCl_3$ , where R represents an alkyl, substituted alkyl, aryl, or substituted aryl radical.

**U. S. 2,911,336**, issued Nov. 3, 1959 to Ewald Urbschat and Paul-Ernst Frohberger, assigned to Farbenfabriken Bayer A.G., discloses the fungicidal and bactericidal

properties of benzoyl-azo-p-nitrosobenzene.

**U. S. 2,912,793**, issued Nov. 17, 1959 to Bobbie D. Stone, Eli Seifter, and Philip H. Santmyer, assigned to Monsanto Chemical Co., discloses a method of controlling nematodes by introducing sulfur dioxide to the soil and subsequently raising the pH of the soil to neutrality with ammonia.

**U. S. 2,913,369**, issued Nov. 17, 1959 to John H. Haslam and assigned to E. I. du Pont de Nemours & Co., disclosed the fungicidal properties and water-repellent properties of compounds such as pentachlorophanoxy polytitanyl stearate.

**U. S. 2,913,370**, issued Nov. 17, 1959 to Van R. Gaertner and assigned to Monsanto Chemical Co., discloses the use of N-(dithiocarboxy) amino acids as viricides.

**U. S. 2,913,371**, issued Nov. 17, 1959 to Clayton Peters and assigned to the Dow Chemical Co., provides a fumigant composition containing carbon disulfide, for the control of insects such as flour beetles and grain weevils in stored grain

## FERTILIZER PROCESSES

**U. S. 2,905,597**, issued Sept. 22, 1959 to Joseph D. Stafford, Jr., and Carl E. Allemans, assigned to Phillips Petroleum Co., describes a method of recovering ammonia from underground storage caverns, free of contamination with water and mineral salts.

**U. S. 2,908,561**, issued Oct. 13, 1959 to James E. Seymour and assigned to Central Farmers Fertilizer Co., describes a method for producing enriched superphosphates with reduced free moisture and acidity. Calcium metaphosphate is added to the superphosphate. The metaphosphate is hydrolyzed in the presence of the free moisture and acid, to form orthophosphate. ▲

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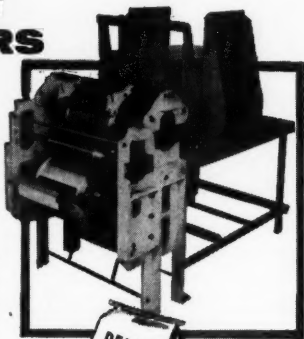
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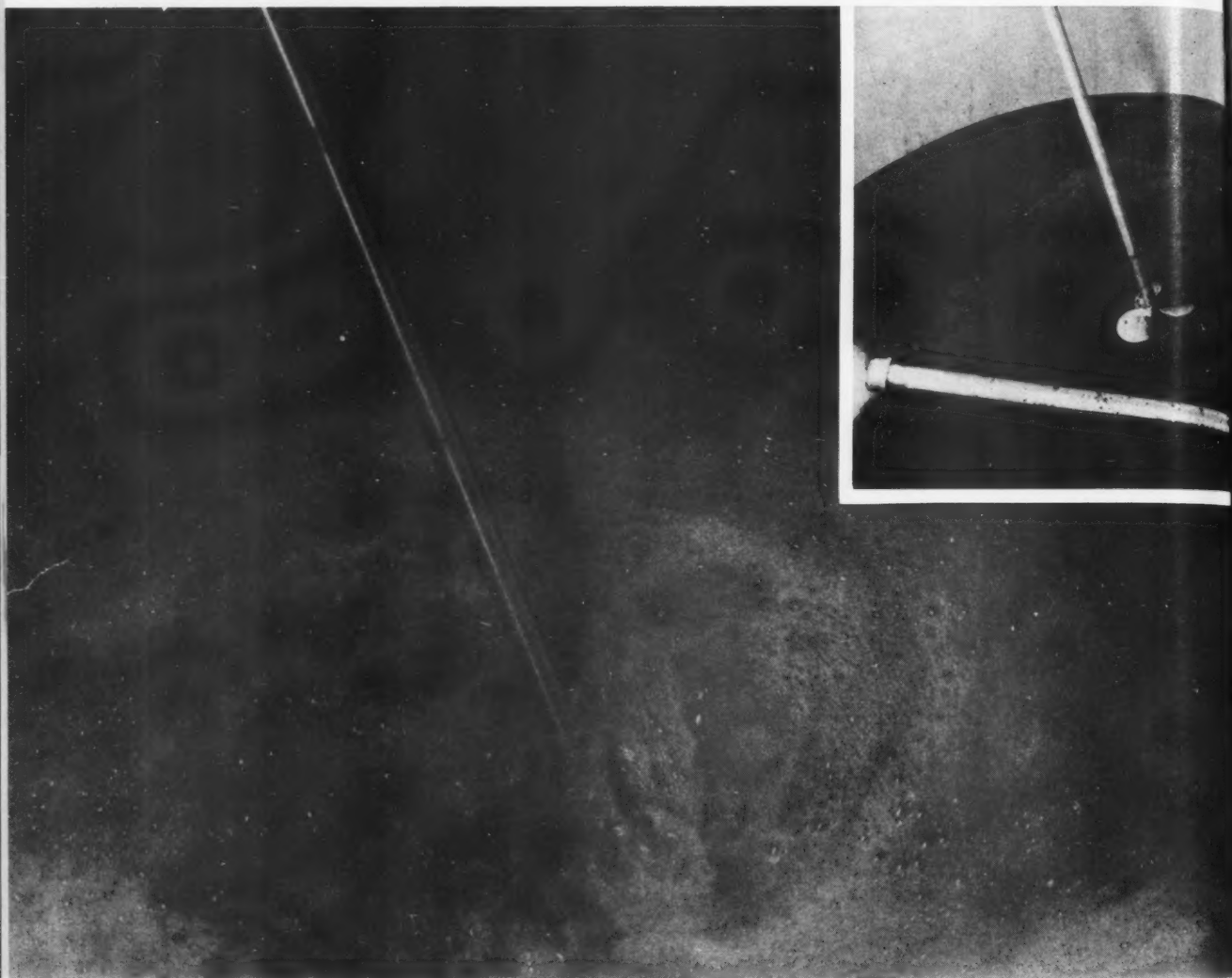
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## PRODUCTION METHODS



**Interior view** of mixing tank during actual ammoniation. Inset shows ammonia sparger and agitator.



**At left:** Nelson Abell in the mixing tank pit. The pump and motor for unloading the tank are shown.

Biggest problem faced by the liquid fertilizer industry is that of obtaining acid during the relatively short season of peak demand. Storage of large quantities of ammoniated solution is at least a partial answer to the problem.

FARM CHEMICALS was interested in getting the story of how progressive companies were putting TVA research findings into practical use. This month we're proud to present the story of how Ouachita Fertilizer & Chemical Company, Monroe, Louisiana, applied TVA research to actual plant operations.

Here's what M. M. Striplin, Jr., chemical engineer for TVA, had to say about the work

# Using **WET PROCESS**

phosphoric acid to make complete liquids

**H**ERE is the story of how a liquid fertilizer company successfully modified its plant to utilize TVA laboratory findings with wet process phosphoric acid and superphosphoric acid. Results: reduction in formulation and distribution costs through the use of these raw materials, plus the reaping of benefits which always result when an improved product is offered to the market.

Nelson D. Abell of Ouachita Fertilizer & Chemical Co., Monroe, Louisiana, told FARM CHEMICALS last month:

"Our interest in wet process acid dates back to the time we first realized that furnace acid was not likely to get cheaper... Our investigation consisted primarily of reading all that we found on the subject, and later, talking to a few operators who had actually experimented with ammoniating wet process acid in liquid fertilizer.

## **DISTRIBUTION—"AN INTEGRAL PART"**

"Always, we were discouraged by the fact that the finished product made from ammoniating wet process acid was not suitable for prolonged storage. *Now, distribution is an integral part of a liquid fertilizer manufacturer's problem.* It is also a well known fact that availability of phosphoric acid for a brief period during the peak spring season can be a problem."

Abell told FARM CHEMICALS that both of these

factors influenced their planning. Having finished product storage, he said, enables the manufacturer to spread his manufacturing operation over longer periods and thereby avoid the rush for acid during the peak season.

"Economies can be affected in both manufacturing and distribution. In view of these considerations we have always maintained a substantial amount of finished product storage. Therefore, we felt we could not consider utilizing any process to make a product that did not store well for at least 90 days," Abell continued.

## **TVA VISITED TO STUDY RESEARCH FINDINGS**

"First encouraging reports we received were printed in various trade journals and described the TVA work with superphosphoric acid," Abell related. "We traveled over to TVA and observed their work in their laboratory. They actually made a number of formulations we were interested in. They varied the percentages of  $P_2O_5$  derived from wet process acid and superphosphoric acid. Also, they made slightly more concentrated fertilizers of the same ratios so that we could determine salt-out temperatures."

Abell said that they kept the samples which had been made in the laboratory for about 90 days and observed them for signs of separation or crystallization at various temperatures. Their conclusion was that at least the laboratory samples of certain formulations

of Nelson D. Abell, owner, and A. V. Frost, plant superintendent, for the Louisiana firm:

"I have visited the plant at Monroe, Louisiana, and was impressed with the setup including the volumetric system described by Mr. Abell for measuring the wet-process phosphoric acid (see article).

"This was the first plant to use superphosphoric acid successfully in conjunction with wet-process phosphoric acid for the production of clear liquid fertilizers. Mr. Abell and Mr. Frost have done an excellent job in applying the laboratory results in their plant, and we are pleased with the contribution they have made to the production of improved liquid fertilizers from wet-process

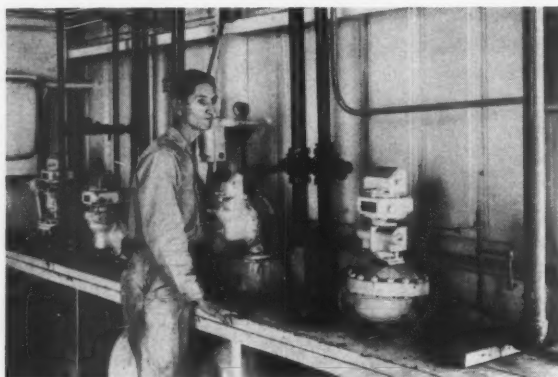
phosphoric acid."

He added:

"This work is significant because it provides a way in which wet-process phosphoric acid can be used by the liquid fertilizer industry to decrease costs and to help overcome the shortage of furnace acid without significantly shortening the quality of the product and changing its storage characteristics appreciably. Several other plants are now using the process and have profited by this work. Mr. Abell and Mr. Frost quickly devised ways to handle the superphosphoric acid, which has caused difficulty to some operators because of its greater viscosity."



## PRODUCTION METHODS



A. V. Frost, superintendent, at meter bench. Meters (1 to 7) are for  $\text{AA}$ , phosphoric acid, nitrogen solutions and water.

were all right and they determined to modify their plant to utilize wet process acid and superacid.

Now they were faced with the problem of *how* to modify their plant.

The conditions were these: They had a batch system, using a stainless steel reactor tank. Anhydrous ammonia, phosphoric acid, water and nitrogen solution were metered. Potash was measured with a weigh hopper on a scale.

"It was necessary to preserve the pyrophosphates in superacid in order to sequester the ammoniated wet process acid," Abell explained. "Dilution of superphosphoric acid brings about reversion to orthophosphates. If superphosphoric acid is added to a neutral solution of liquid fertilizer the characteristics of the acid are preserved."

### WHICH METHOD TO USE?

Thus, they had two choices. They could either make up a base solution of 11-33-0 containing the pyrophosphates which would be added to the mixing tank prior to the start of the process, and then add wet process acid and ammonia simultaneously. Or they could attempt to add the superacid and wet process acid and ammonia simultaneously—after having first made a small amount of neutral solution of ammonium phosphate from wet process acid prior to the addition of superacid.

The latter method was chosen, because it was a one-step manufacturing process—and because it required no expensive plant addition to afford cooling. To manufacture 11-33-0 using anhydrous ammonia would mean an enormous heat transfer.

In pilot runs they made 4-11-11 in their plant reactor tank, adding the acid by hand. Abell said that one important thing they had to do was to start the wet process acid far enough ahead of the superacid to make a neutral solution prior to the introduction of superacid—so as to create a neutral solution to preserve the pyrophosphates. At the same time, they could not afford to wait too long to start adding the superacid, because they would not get sequestration until the pyrophosphates were present.

Adding pyrophosphates after ammoniation is not satisfactory, Abell explained. Another important thing they had to do was to adjust the rate of addition of both acids and ammonia so that during the reaction



Equipment shown includes mixing tank top, potash weigh hopper, acid measuring column, and strainers in load-out line.

they maintained acid pH.

They found that the limits were not critical, but if the pH is too low during the reaction, or if it is alkaline, the process is not satisfactory.

Abell and his associates observed samples of the product made in these pilot runs and determined that their characteristics were satisfactory (the samples were still satisfactory after one year. Although there is some flocculation a slight agitation apparently restores the product to a homogenous state), Abell reported.

"Since in the pilot runs we added the acid by hand we now had to devise a means of measuring both acids during production. Actually, the superphosphoric acid presented no problems because the same stainless steel meter we had been using on furnace acid handled the superacid," he continued.

In the case of the wet process acid, they encountered a different problem. They were advised by the meter manufacturers that a roto-cycle type meter would probably not be satisfactory for metering a product as high in solids as wet process acid is.

On a trial basis they installed a flow-rating device which did the job it was designed to do, but which did not lend itself to a batch type operation.

"We decided that a volumetric measuring system would have to be employed," Abell explained. "In order to make our measurements accurate and also to be able to determine the flow rate, we decided to build a measuring tank of relatively small diameter so that as little as one gallon would register on the sight gauge. In fact, we made the calculation so that one inch would equal one gallon," Abell explained. "In order to get the acid out of the tank as fast as the reaction could go forward, we piped air to the tank. We installed a regulator in the airline and by experimenting found out what pressure setting we required to achieve the desired flow rate," he continued.

Different formulations required different flow rates due to variations in percentages of  $\text{P}_2\text{O}_5$  derived from wet process acid, difference in reaction time and so on, he concluded.

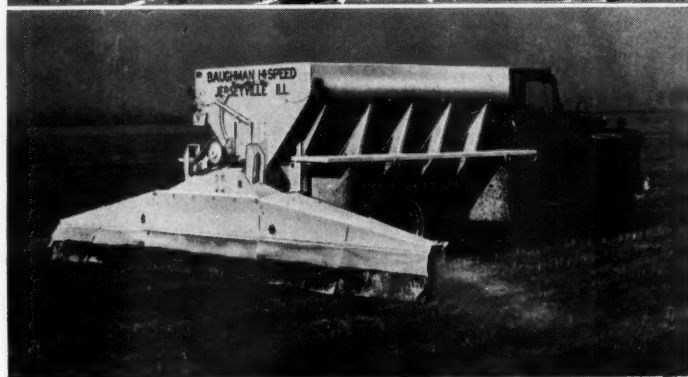
In February 1959 Ouachita Fertilizer & Chemical Company began plant operation using the new process. Operations continued without complications until shutdown in July. The company looks forward to another good year in 1960. ▲

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## Figuring the odds in your market

Would you agree with us that a vast majority of companies are *half asleep* when it comes to planning, forecasting, advertising, sales promotion and all the other phases of marketing?

Do you have a "future plans department?" How many companies do? Just the *most successful ones*, according to Thomas B. McCabe, president of Scott Paper Company, whom we quoted on this page in February.

In a talk before the Sales Managers Association of Philadelphia in January, he said that the most successful companies consider future plans a *major staff function*.

"If you were to check the list of companies that have moved from the medium brackets into the big leagues since the end of the War, and if you were to look over the big ones that have grown still bigger, you would notice a striking similarity.

*"The companies that achieved the biggest growth have been those that have recognized the importance of the marketing function and placed it on par with other top management functions in the company," McCabe reported.*

*Odds are that you're going to have to "go like 60" this month if you're going to deliver the amount of fertilizer and pesticides that your books showed for the banner year 1959.*

Reports from the West, for instance, are that "March roared through the mid-point in the Intermountain Area, leaving producers of fertilizers blue and somewhat down in the mouth." The report continued: "What was originally forecast as a banner season in 1960 may prove a dud unless there is a sudden break in the weather."

One Salt Lake sales manager told a FARM CHEMICALS reporter that "ordinarily our phone is ringing off the wall at this time of the year. Now we're 75 to 80 per cent behind a year ago at this time in sales and sales commitments."

So the pressure is on! What do you do to capture a lion's share of the market? Actually, we've been giving you the answer to that question for some 15 months now.

Past experience has shown us that the weather "acts up like this every once in awhile." It's one of the major unknowns in the farm chemicals picture. Would you have been better off knowing what the *odds* were that this would happen a few months ago?

Marketing in the sixties will depend on scientific forecasting! Where have you read that before? St. Thomas, Lazo, Klaus, Hartzler—all these men emphasized it in one way or another in this magazine the past months.

What would you give for some scientific information on *weather prospects* for your area *next month*? Note we didn't say *weather forecasts*! The latter can be used in conjunction with *past weather history*, however.

We suggest that if you're "interested," don't overlook the new, exclusive *marketing* feature which starts this issue on page 19. Space does not permit discussion of this exclusive editorial feature (for this publishing field). But we hope that it will be just another helpful service to guide you in marketing.

*We think that the "odds" are you'll use it to advantage and take us up on our request that you suggest other information, such as temperature, humidity, etc., that can be useful to you.*

This just might prove to be the *competitive advantage* you've been looking for.

In this regard, we can't help but think of what F. M. Batson of General Chemical Division, Allied Chemical Corporation, told those attending the National Fertilizer Solutions Association last November in St. Louis.

He was discussing the color factor in production of fertilizer solutions. One manufacturer who once told him that "he couldn't sell a milky white fertilizer solution, because the farmers are used to seeing it water white," has since found

*"The color factor is what you make it."*

Through successful promotion he turned a sore point into a sales point and now says that "our farmers prefer the milky color because they can see what they are getting."

This month, our *Production Methods* section carries an article about Ouachita Fertilizer and Chemical Company of Monroe, Louisiana—first company to successfully use wet process in the production of liquid fertilizer.

However, FARM CHEMICALS' editorial policy is this: we don't think that any "success story" is complete, until the end of the sales season. No matter how efficient a manufacturing process a company possesses . . .

*. . . it will not guarantee them a profit!* They still have a selling job to do—and whatever competitive advantage they might have will be *what they make it!*

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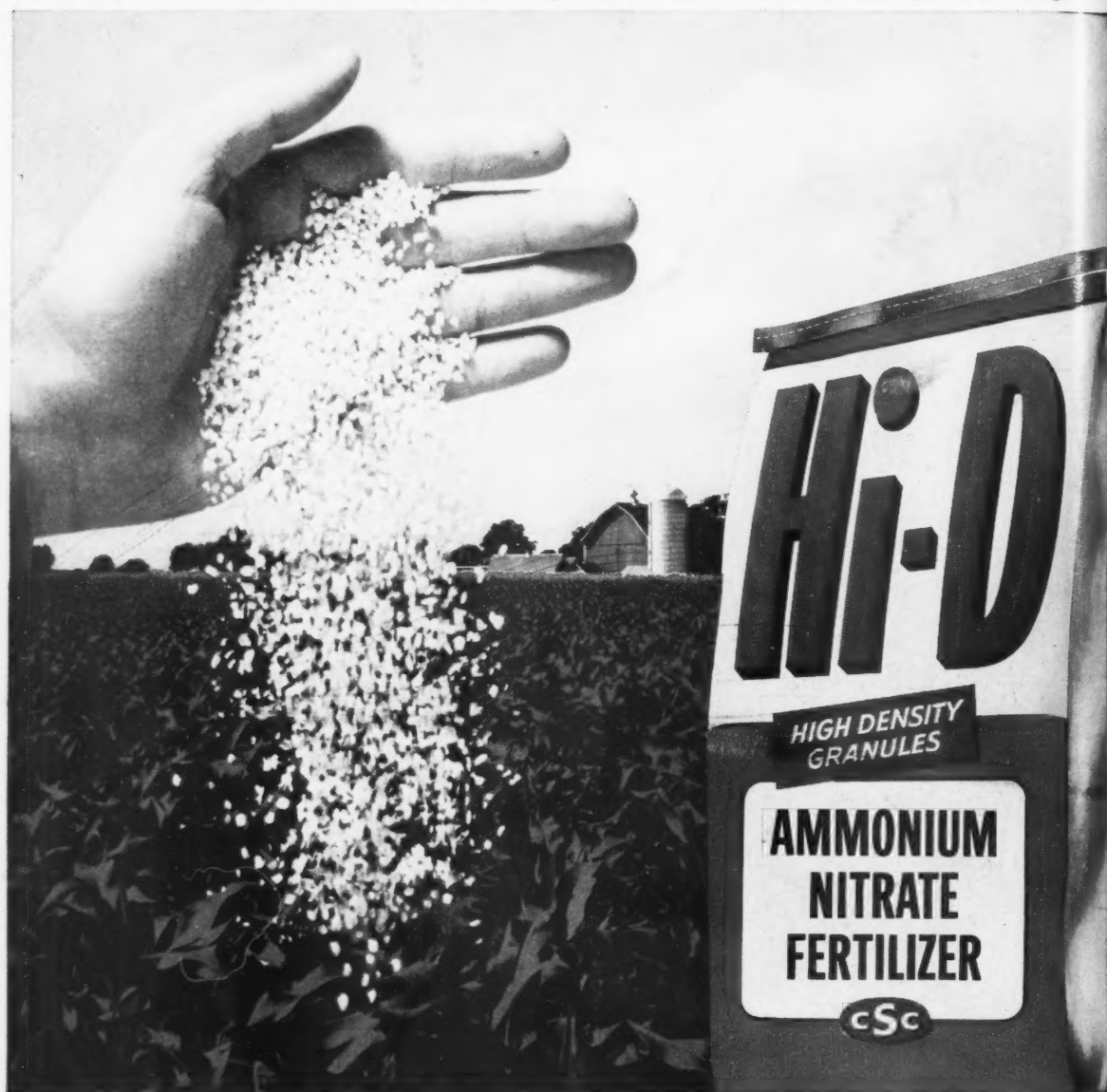
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↓ *During the fertilizer season, advertisements like this in full color are appearing in Farm Journal, Farm & Ranch, Progressive Farmer, and Successful Farming.*



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